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ABSTRACT

This project was concerned with the utilization of communications satellites to assist in the implementation of P.L. 94-142, which deals with discrimination against the handicapped and provision of public education for handicapped children. The results of a national survey on personnel development needs of state education agencies are reported; responses to a questionnaire assessing the need for satellite-delivered programming in special education are considered; and the rationale, objectives, target states, and target populations for initial delivery efforts in three program areas--technical assistance, direct service to gifted and talented students, and community awareness/parent education--are outlined. A work breakdown structure, a narrative of work, a PERT diagram, a project framework, and position descriptions for all program, technical, and management areas are provided. Appendices include letters of support, a bibliography, and a glossary. (Author/CMV)

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The Final Report/Proposal for:

A PLAN FOR APPLICATION OF
COMMUNICATIONS SATELLITES IN EDUCATION
(SPECIAL EDUCATION SATELLITE PROJECT)

Technical Proposal

Submitted to:

The National Institute of Education

Submitted by:

The Council for Exceptional Children (CEC)
1920 Association Drive
Reston, Virginia 22091
703/620-3660

Submitted on:

March 31, 1978

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THE COUNCIL FOR EXCEPTIONAL CHILDREN



March 31, 1978

National Institute of Education
Contracts/Grants Management Division
Room 721, Stop 37
1832 M Street, Northwest
Washington, DC 20208

To Whom It May Concern:

Attached for your records is a copy of the Final Report regarding the Application of Communications Satellites in Education. The Report is submitted this date in accordance with provisions set forth in Contract No. 400-77-0110.

The Report serves as a "Phase II" proposal for NIE funding in response to RFP NIE-R-77-0012 as an official proposal of The Council for Exceptional Children.

Respectfully,

William C. Geer

William C. Geer
Executive Director

ABSTRACT
A PLAN FOR APPLICATION OF
COMMUNICATIONS SATELLITES IN EDUCATION
(SPECIAL EDUCATION SATELLITE PROJECT SESP)
Contract No. 400-77-0110

Presented is the final report/proposal of the Special Education Satellite Project (SESP), a program for the utilization of communications satellites to assist in the implementation of federal legislation (Public Law 94-142, the Education for All Handicapped Children Act of 1975 and Section 504 of the Vocational Rehabilitation Act of 1973) which deals with discrimination against the handicapped and provision of public education for handicapped children. In an introductory section, the results of a national survey on personnel development needs of state education agencies are reported; responses to a questionnaire assessing the need for satellite-delivered programing in special education are considered; and rationale, objectives, target states and target populations for initial delivery efforts in three program areas (technical assistance, direct service to gifted and talented students, and community awareness/parent education) are outlined. Among conclusions based on a review of alternative delivery system approaches (such as local/regional distribution systems, instructional television fixed service, and community antenna television) is that national service applications should be planned using existing service commercial satellite delivery systems. In a third section on the SESP operational plan a work breakdown structure, a narrative of work, a PERT (project evaluation and review technique) diagram, a project framework and computer-generated work schedule are presented for each of the program areas. These delineations are also included for the technical component, management component, and evaluation component. Covered in the final two sections are personnel (including position descriptions for all program, technical, and management areas; and vita of key people) and budget. Appendices include letters of support, bibliography and a glossary.

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I. USER NEED: INTRODUCTION

USER NEED: INTRODUCTION

Since November 29, 1975, when President Gerald Ford signed into law the Education of All Handicapped Children Act of 1975 (P.L. 94-142), the education of America's handicapped children has become a major focus of action and reaction by the Nation's education community. By and large, American educators supported the intent of the law, which in essence mandated the appropriate education of every handicapped child in conformity with an individually planned educational program. In addition, a variety of responsibilities for each level of government involved in the education of these children was specified including monitoring personnel training, placement of handicapped children in regular classrooms when appropriate, and implementing systems of procedural safeguards for children and parents.

While general approval of the intent of this Act was widespread, so too was concern about its implementation. Often, the basis for this concern centered upon what was described as the specificity and uniqueness of this Act. Usually, these items included those indicated above and, in particular, the individualized education program (IEP), procedural safeguards, inservice training and the overall administration of the entire Act.

As interpretation and implementation of P.L. 94-142 was being initiated, another Federal requirement, Section 504 of the Vocational Rehabilitation Act of 1973 (P.L. 93-112), the "handicapped" civil rights law, was regulated (May 4, 1977) and added support to the principle that all American handicapped children are entitled to an appropriate public education. This same statute also required affirmative action/nondiscriminatory practices for handicapped children and adults in "any program or activity receiving Federal financial assistance."

Discovery of these new requirements for children with special learning needs has also led to the growing recognition that the majority of the Nation's 2.5 million gifted and talented children are also not receiving an appropriate

education. It is logical that this discovery should be made, since in most state education agencies and consequently in most local education agencies, the administrative structure used places responsibility for gifted and talented and handicapped children in the same office usually categorized as special education.

It is with recognition of these major national education and related needs that effect every education agency at all levels of government, other public and private child serving agencies, such as departments of mental health and mental retardation, an unknown number of parents and private citizens, and above all, ten million handicapped and gifted and talented children, that this proposal has been developed. As a result of carrying out the activities proposed in the now completed planning grant (#400-77-0110) as well as additional efforts, the need for the development of a national system for the provision of technical assistance, community awareness/parent education and selected direct student instruction for gifted and talented children has been documented. In addition to documenting these content and audience needs, it has been specifically determined that an appropriate delivery system to meet the nationally distributed demand must build upon a varied telecommunications system including the use of satellites.

National Needs Assessment

A significant requirement of P.L. 94-142 is that, "a comprehensive system of personnel development" must be established by each state education agency (SEA) to meet the needs of the multiple categories of people, professional and non-professional, that will be involved in implementation of the Act, in order to be eligible to receive funds. The comprehensive system of personnel development must be described by each SEA in its Annual Program Plan, which is submitted to the Commissioner of Education for approval. A complementary provision is contained within the law and applies to local education agencies (LEAs). To participate in the funding of this Act, LEAs must write applications to the SEA for approval,

which are required to contain a description of how they will take advantage of the SEA provided system.

To gain understanding of the Nation's needs in personnel development for the education of the handicapped, each state's Annual Program Plan, with the exception of New Mexico which has not been submitted, was reviewed with specific analysis of the section containing the Comprehensive System of Personnel Development. Analysis of these Plans initially indicated that state administrators anticipate a wide variety of content needs for personnel involved in educating handicapped children. Thirty-three different topics were identified as the subject of planned activities for personnel development. The topics arranged in descending priority order and the percentage of states indicating the same need are contained in Table 1.

Table 1: RANK ORDERING AND PERCENT OF STATES INDICATING
THE SAME AREA TOPICS FOR NEEDED PERSONNEL DEVELOPMENT

Topic Area	Rank	Percentage of States with Same Need
Develop, implement and review IEP	1	86
Preplacement evaluation and re-evaluation	2	82
Instructional procedures/classroom management	3	80
Least restrictive environment (mainstreaming)	4	76
Native Language, nondiscrimination in testing and instruction	5	74
Procedural safeguards	6	72
Full educational opportunity	7	68
Surrogate parents	8	62
Child Service Priorities	9	58
Curriculum/Programming/Materials/Resources	9	58

Consideration of the content topics of need is instructive in terms of what is estimated as needed by the states in order to accomplish effective implementation of P.L. 94-142. What must be emphasized, however, is that this is a "list" of today at the beginning of implementation. Tomorrow, new priorities will emerge particularly as the country experiences the Act and adjusts to more fully achieve its mandate. That such adjustments will lead to changes in the topics of need is certain and this was recognized by the Congress (since states and localities must annually submit program plans and local applications).

In planning a system for the delivery of personnel development services, it is insufficient to identify only the content areas. Equally important is identifying the recipients that are in need of information and other assistance and in consideration of the content area. By categorizing and summarizing information from state Annual Program Plans for each content area and the related target recipients, the overall highest priority groups to receive training in priority topic areas were identified. Table 2 below presents the overall highest priority groups and the highest priority topic areas in which these individuals are to be provided with information and assistance, as indicated by the percentages of states listing them. The personnel groups listed are those occurring most frequently, but they are not rank ordered in this table. The rank order numbers in Table 2 refer to the order of importance of the topic area for each group listed. The table should be read down the columns rather than across.

Our analysis of the State Annual Program Plans revealed that while 80 percent of the states identified categories of individuals who needed training and assistance, they did not always relate these to content areas. Consequently, we also examined the Plans to determine the overall highest priority personnel groups without consideration of content area. This is displayed and rank ordered in Table 3. The groups are arranged into categories for the purpose of clarity

Training Topic Areas	Teacher - Regular	Teacher - Special	Teacher - Physical Education	Para-professional/Aide	Psychologist/Psychometrist/Educational Diagnostician	Speech Pathologist	Administrator	Supv./Coordinator	Hearing Ofcr. Surrogate Parent	Parent	Volunteer	Other
<u>PLANNING AND POLICY DEVELOPMENT</u>												
Implementing P.L. 94-142 and Federal Legislation	4						4			1	2	2
<u>PROCEDURAL SAFEGUARDS</u>												
Procedural Safeguards Surrogate Parent		4					3	2	1 2	3	3 3	1
<u>CHILD EVALUATION</u>												
Evaluation Procedures	3	3			1						4	2
-Preplacement Evaluation												
-Re-evaluation												
Protection in Evaluation					2						4	
- Native Language, Nondiscrimination in Testing & Instruction												
<u>INDIVIDUALIZED EDUCATION PROGRAM</u>												
Develop, Implement, Review IEP, Content	1	1	1		3	1	1	1		2	2	2
Instructional Procedures/Classroom Management	2	2		1						4	1	2
Curriculum/Programming/Materials/Resources												2
<u>EDUCATIONAL PLACEMENT</u>												
Least Restrictive Environment	2	3					2			3		

Table 2: PRIORITY RANKING OF TOPIC AREAS FOR PRIORITY GROUPS IN NEED OF INFORMATION AND ASSISTANCE

<u>Priority Ranks</u>			
Overall- Not Related To Topic Areas	Overall- Related To Topic Areas	Within Category- Related To Topic Areas	Personnel Groups By Category
<u>INSTRUCTION</u>			
1	1	1	Teacher-Special Education
6	-	-	(severe-profound)
7	-	-	(preschool)
2	3	2	Teacher-Regular
			(content areas)
6	9	3	Teacher-Vocational Education
3	10	4	Paraprofessional/Aide
7	12	5	Teacher-Physical Education
<u>SUPPORT</u>			
6	5	1	Psychologist/Psychometrist/Educa-
			tional Diagnostician
-	8	2	Speech Pathologist/Audiologist
7	11	3	Social Worker/School Nurse
-	13	4	Work Study Coordinator
-	14	5	Occupational Therapist
7	16	6	LEA Personnel (in general)
7	18	7	Recreational Therapist
7	19	8	Pupil Personnel (in general)
<u>ADMINISTRATION</u>			
2	2	1	Administrators (in general)
6	4	2	Supervisor/Coordinator
5	21	3	Administrator-Principal
4	22	4	Administrator-Special Education
<u>OTHER</u>			
5	6	1	Hearing Officer/Surrogate Parent
6	7	2	Parents
-	15	3	Other (noninstructional staff)
7	17	4	Volunteer
-	20	5	State Level Personnel
7	-	-	Institution of Higher Education
7	-	-	Private/Parochial/Institution

Table 3: PRIORITY GROUPS TO BE TRAINED BY STATES.

and examination. The categories of instruction, support, administration and other reflect natural groupings which emerged from review of the Plans. The category of other includes groups not associated with the local education agency.

The groups in Table 3 are given priority rankings in three different ways. The first ranking is for groups listed by states without relation to topic areas. That is, they are merely listed as target groups to be trained. The second ranking reflects the frequency with which the groups were mentioned across topic areas and across states. This ranking probably provides the clearest indication of the topic groups to be trained. The third ranking is of groups related to topic areas across states within the four categories. It is a more specific presentation of information in the second ranking.

Training modes and resources to be used to deliver information and assistance in the previously described content areas to the previously described priority groups were also identified. Essentially, it was found that training modes and resources to be used for delivery were infrequently specified. Table 4 displays the top ten priority topic areas planned and the modes and resources to be used. This information would seem to show either a lack of resources known or available, a dependence on traditional modes, or a lack of specificity in planning.

The personnel to be used to implement the state described systems of personnel development were described as being in universities and colleges, state education agencies, local education agencies and other sources. Forty-two percent (42%) of the Plans specified the source of trainers to implement training. For the most part, the source of trainers was specified as the state education agency and institutions of higher education. Fourteen percent (14%) stated that they planned to present training to key trainers who would do the local level inservice training in a "trainer-of-trainers" model.

Of significant contrast to both the modes of information and service delivery and personnel to be used by the states is the results of a limited, yet somewhat national, needs assessment that was conducted by the University of Kentucky as part of a June 1977 conference regarding the application of communication satellites to the education of exceptional children. Approximately 75 persons from across the country attended the conference, which was sponsored by a Bureau of Education for the Handicapped grant (Blackhurst, Williams, Churchill, Allen and Siegel, 1978).

As part of this conference, a demonstration of the use of satellites was provided. This involved the broadcasts of a simulated special education placement committee meeting via the ATS-6 satellite to 145 people representative of the previously indicated groups of recipients at 16 sites in the Appalachian Region. This was a cooperative project with the Appalachian Educational Satellite Program.

Participants at the conference were asked to describe their interest in other special education topics that could be delivered by satellite. They were asked to indicate their interest by responding to 30 items on a three point scale, with 1 = no interest, 2 = some interest, and 3 = great interest. Table 5 provides the results of this questionnaire by rank ordering topics by mean rating. It is interesting to note that 28 of the 30 items had mean ratings between some and great interest.

The results of this questionnaire represent a significant effort to assess the needs for satellite-delivered programming in the area of special education. Since the respondents had participated in a program that delivered content in special education to them via satellite and permitted them to ask questions from remote sites, it would seem appropriate to state that questionnaire respondents had an experiential base upon which to make their judgements. Consequently,

Priority Rank Planned	Priority Training Topic Areas	Modes and Resources Listed by States
1	Develop, implement, review IEP.	SEA, IHE, LEA, Child Service Demonstration Center, RRC, State Conference, Workshop, Consultation, Miniclinic, Discussion, Special Ed. Training Series Module, NLRC/P Inservice Series, IEP Booklets, System FORT, Imprint, Special Ed. Technical Assistance and Evaluation Personnel.
2	Evaluation Procedures	SEA, IHE, LRC, Regional and State Personnel, Consultants, Existing Programs, Workshop, NLRC Manual, NLRC/P Inservice Series, Teacher Resource Bank, Imprint.
3	Instructional Procedures/Classroom Management	SEA, IHE, ALRC, Statewide Program of Inservice, Department of Mental Health, Miniclinics, Discussions, Training Films.
4	Less Restrictive Environment	SEA, IHE, Workshop, Consultant, Teacher Resource Bank, Guide to Alternatives.
5	Protection in Evaluation	SEA, IHE
6	Procedural Safeguards	None listed.
7	Implementing P.L. 94-142	SEA, IHE, Division of Vocational Ed., Regional Child Study Team, Pupil Personnel Services, Child Service Demonstration Center, LEA, Workshop, Institute.
8	Surrogate Parent	SEA
9	Priorities	None listed.
9	Curriculum/Programming/Materials/Resources	SEA, LEA, IHE, ALRC, RRC, Pupil Personnel Services, Consultants, Regional and State Level Personnel, Information Pack, Training Pack, Handbook on Career Development, NLRC Manual, NLRC/P Inservice Series, Teacher Resource Bank, Standards for Selecting Materials, Stimulus Materials Packages for Parents.

Table 4: SUMMARY OF MODES FOR RESOURCES PLANNED TO DELIVER INFORMATION AND ASSISTANCE IN PRIORITY TOPIC AREAS OF 50 ANNUAL PROGRAM PLANS

N = 78

CONTENT TOPIC	RANK	AVERAGE RATING
Working with parents of the handicapped	1	2.61
Techniques for mainstreaming	2	2.56
Instructional materials appropriate for the handicapped	3	2.50
Language development techniques	4	2.48
Design and development of instructional materials	5	2.47
Special needs and procedures for the emotionally disturbed	6	2.45
Due process and procedural safeguards	7	2.45
Special needs and procedures for the mildly retarded (EHR)	8	2.44
Career/vocational education for the handicapped	9	2.43
Classroom management of exceptional children	10	2.42
Special needs and procedures for the multiple handicapped	11	2.42
Record keeping systems	12	2.41
Task analysis and instructional planning	13	2.40
Special needs and procedures for the gifted	14	2.35
Informal educational assessment	15	2.32
Working with the resource room teacher	16	2.31
Special needs and procedures for the moderately retarded (TMR)	17	2.29
Reading diagnosis and instruction	18	2.21
Special needs and procedures for the speech impaired	19	2.20

Table 5: RANK ORDERING OF CONTENT TOPIC OF INTEREST FOR SATELLITE-DELIVERED PROGRAMMING RELATED TO SPECIAL EDUCATION.

N = 78

CONTENT TOPIC	RANK	AVERAGE RATING
Special needs and procedures for the deaf and hard of hearing	20	2.20
Adapted physical education	21	2.19
Educationally relevant characteristics of exceptional children	22	2.15
Assistive and adaptive equipment for the handicapped	23	2.15
Special needs and procedures for the crippled	24	2.15
Special needs and procedures for the hearing disabled	25	2.10
Special needs and procedures for the blind and partially sighted	26	2.09
Special needs and procedures for the severely retarded (SMR)	27	2.09
Math diagnosis and instruction	28	2.08
Translating IEPs	29	1.97
The role of the impartial hearing officer	30	1.95

Table 5 - Continued

considerable credibility could be placed in the position that the areas of interest expressed by the questionnaire responses are accurate and that content delivered in these areas would meet the needs and interests of potential recipients.

Most significant and worthy of note as well is that the content topics identified by this sample represent with one exception the full list of topics used for analysis of the State Plans. The exception is item 14 "Special Needs and Procedures for the Gifted." Thus, one could conclude that despite the fact that the states did not in their Plans consider telecommunications as a delivery system, such an approach could be used to reach the same target groups in the same content areas. Further, as will be indicated later, such a system can overcome many of the limitations inherent in the modes of delivery presently being contemplated.

That the type of telecommunications system proposed here offers a viable alternative that would be seriously considered by the states is specifically indicated by the State Directors of Special Education in California, Minnesota and Virginia in letters attached to this proposal in Appendix A. Since it is these individuals who are responsible for planning and executing the personnel development systems in their states, it should be emphasized as well that they have available personnel and dollar resources that could be committed to these efforts. The analysis of the State Plans determined that about half the states indicated that the funding sources to be used for the provision of training and other assistance were a combination of Federal and state money, funds which could be used to support services provided by the telecommunications system proposed here.

Program Areas

Careful consideration of the information presented above in relation to the needs of the American citizenry and, in particular, to the national education community as it moves to implement P.L. 94-142, Section 504, and also in meeting the special learning needs of gifted and talented children in relation to the power and cost of telecommunications, has led to focus initial delivery efforts in three areas. These are technical assistance, mentor programs for gifted and talented, and community awareness/parent education. Presented below are specific presentations of why each of these was selected and what form they will take when the project becomes operational.

Technical Assistance Program Area

1. Rationale

As indicated, a variety of specific information and other assistance is needed especially by local education agencies for the implementation of P.L. 94-142 and Section 504 of the Vocational Rehabilitation Act of 1973. A system of communication practices which can bring these services in the form of information and skill training can be collectively called technical assistance (TA).

Gallagher (1974) has defined technical assistance as:

Help from an outside agency designed to improve the competence of educational service delivery personnel by increasing their management, organizational or program skills, and/or their available information, relative to their multiple tasks of educational service delivery to students.

The Special Education Satellite Project (SESP) builds upon this definition of technical assistance but alters it to emphasize the relationship between locally determined needs and technical assistance in relation to children with unique learning needs by stating that technical assistance is help from the SESP designed to meet specific identified needs of LEA personnel by increasing their management, organizational and program skills (including teaching, administrative

skills, and community involvement) and/or their available information relative to the implementation of P.L. 94-142 and Section 504.

Providing a free appropriate education for handicapped children in the least restrictive environment (often called mainstreaming), as mandated by the law, is a monumental undertaking for the Nation. When the actual work of carrying out this mandate is translated at the local level, problems, often based on a lack of knowledge and skills, may hinder this implementation. Difficulties are already occurring among all those involved in public education -- classroom teachers, administrators, school board members, related services staff, parents, and the community-at-large. Negative reactions have in some situations developed due to misunderstandings, as well as a lack of knowledge and skills in addressing the needs, on both a long range and daily basis, of handicapped children. Edwin Martin, Deputy Commissioner of the Bureau of Education for the Handicapped, has said that,

Efforts to provide training and experience for regular classroom teachers are not keeping pace with efforts to mainstream (Martin, 1976).

This same observation can be extended to all school personnel as well. Technical assistance, of which inservice training is a part, could assist in ameliorating this negative and counter productive situation.

Technical assistance, as conceptualized here, uses carefully selected or prepared human and other resources to meet locally determined needs and goals. We believe that it is the development of the human relationships in the technical assistance communication process between the provider and recipient that is viewed as being either supportive of, or destructive to, achieving the objective and meeting needs. Technical assistance as a change agent has been effective when a trust relationship has been established and maintained between the provider and recipient of the technical assistance. Gallagher reinforces this:

Brickell's (1961) study of educational change processes in New York State indicated that change came through the personal demonstration of new ideas and not through standard educational channels. House, Kerins, and Stelle (1972) studied program adoption in Illinois and proposed that change occurs in education when it has been pushed by an aggressive cadre of advocates who can secure adequate resources for the program and defend its integrity from attack. We can note again the personalization of contacts that result in personal changes in the client (Gallagher, 1974).

Consequently, the Special Education Satellite Project, cognizant of both the human factors and technological possibilities involved in providing technical assistance, in part through telecommunications, has created a process intended to produce an effective balance. It is a careful merging of human resources with planned use of satellite technology.

The goal for this program area is to deliver specific technical assistance including inservice training to local education agencies and communities in appropriately educating all exceptional children and the implementation of P.L. 94-142 and Section 504 mandates via satellite as well as other telecommunications and non-telecommunications delivery systems.

2. Objective of Technical Assistance

The objective of the technical assistance (TA) phase of the Special Education Satellite Project is:

To deliver specific technical assistance including inservice training to local education agencies and communities in appropriately educating all exceptional children and the implementation of P.L. 94-142 and Section 504 mandates via satellite as well as other telecommunications and non-telecommunications delivery systems.

This objective addresses the mandates of P.L. 94-142 and Section 504 and will be implemented through an individually designed technical assistance program for each participating LEA. The TA will be designed to meet identified needs of the local education agency in providing the most appropriate education for all handicapped children. A comprehensive program of individually tailored technical assistance will be designed, developed and delivered to educators at selected local sites. The technical assistance program for each site will be responsive to the needs of that particular LEA and will maximize the use of telecommunications technology to effectively and efficiently address identified user needs where such a mode of delivery is most expedient and cost efficient. The design will include the use of satellite communications and cable television connections. The total technical assistance program will include:

- o On-site needs assessment by the Special Education Satellite Project staff member responsible for delivery of technical assistance to that LEA.
- o Written TA agreement formalizing the goals the LEA wants to reach (or problems LEA wants to solve): how the TA will address the goals (activities, resources): and the evaluation method for measuring the success of the TA.
- o Variety of services/resources will be offered through a resource system based on the expertise of special education staff with specific talents, experience and skills in working with LEAs to implement the mandates of P.L. 94-142 and Section 504.
- o Variety of delivery modes will be available based on the TA agreement and determination of what is most effective for achieving the LEAs goals. This includes satellite/cable instructional television

at teachers' site, on-site consultation, seminars, print and audio-visual materials, and a "hot line" for maintaining liaison.

- o Establishment of mutual trust will be fostered throughout the TA program. One SESP TA staff member will be assigned to work with each LEA to carry out the TA process and establish a trust relationship. That professional staff member will be responsible for the site visit, needs assessment, design of TA agreement and services, delivery of TA and subsequent follow-up.
- o Service delivered at no cost to the LEA during the initial cycle. Subsequent cycles will be cost-shared.

3. Target States and Target Population Within School Districts

At this time, we have a committed interest from the states of California, Minnesota and Virginia. Local sites within those states have also been selected, and contacted. Letters of committed interest from the State Directors of Special Education in those states are attached in Appendix A.

These sites were selected on the basis of:

- o Stated commitment to implementation of P.L. 94-142 and Section 504;
- o Demographic characteristics of LEA; urban, rural, suburban or mix;
- o Interest in education technology, acceptability or use of instructional television with LEA school sites; and
- o Proximity to existing satellite-fed ground distribution systems.

Table 6 lists those school districts and their populations (National Center for Educational Statistics). Should any of the identified sites not be able to participate in the project, suitable replacements, based on the same selection criteria will be found.

Table 6

States and School Districts Indicating an Interest in Further
Exploring Participation in the Technical Assistance Phase of
the Special Education Satellite Project

States and School Districts	Rural Student Enrollment	Suburban Student Enrollment	Urban Student Enrollment
<u>Virginia</u>			
Selected Schools of the Catholic Dioceses of Southern Virginia			
Pittsylvania County Public Schools	15,102		
Danville City Public Schools		8,660	
Roanoke County Public Schools		24,081	
Newport News City Public Schools			29,976
Roanoke City Public Schools			15,988
<u>Minnesota</u>			
Selected Schools of the Catholic Conference of Minnesota			
Marshall School District	2,367		
Roseau School District	1,388		
Fridley School District		4,936	
St. Cloud School District		11,482	
Rochester School District			14,831
Duluth School District			19,161
<u>California</u>			
Archdiocese of San Francisco Schools			
Siskikou County Public Schools	1,031		
Ukiah Unified School District		8,258	
Santa Maria School District		80,610	
Santa Clara County Schools			21,246
San Diego County Schools			200,000
Total Students Enrolled	19,888	138,027	301,202
TOTAL ENROLLMENT	459,117		

The target groups within each LEA for receiving the services of the Special Education Satellite Project in the technical assistance phase are consistent with the findings of the State Plan review and include:

- o regular and special education teachers;
- o administrators;
- o related services personnel; and
- o school board members.

Direct Service to Gifted and Talented Students Program Area

1. Rationale

Mentor programs, the linking of adults who already stand within the context of a particular tradition, discipline, profession, or craft and who serve as advisors, guides, teachers and role models to gifted and talented students, who seek access to the mentor's world and skills, are generally accepted as a theoretically feasible and significant approach to providing education appropriate for such students. A report at the 1968 White House Task Force on Education stated that the results of a survey of hundreds of successful people indicated that the greatest motivating force for them was an adult, such as, a teacher, coach or community leader, who took an interest in them and built a one-to-one relationship with them. Such opportunities, however, are usually localized, and therefore, are restricted to the available talent within a community. This limitation will be overcome by this project as it will conduct a mentor program using satellite telecommunications.

By using a satellite system, it will be possible to arrange a "mentor relationship" between persons who have knowledge and/or skills in a specified area of interest and a student who would like to learn in that area. Through the use of several forms of

telecommunications, a mentor may become a "long-distant instructor/companion" to a pupil which could enable the student to move toward the responsibility of adulthood as a result of the encouragement, advice and wisdom of a dedicated and successful person who has committed himself/herself to the role of a mentor.

It is hypothesized that the implementation of this mentor program will present a "break-through" in education for gifted students. Dr. Julian Stanley, Director, Johns Hopkins' Study of Mathematically Precocious Youth, reported a high degree of success with seventh graders who learned first year high school algebra rapidly when teamed with a mentor. A more extensive relationship, involving the implantation of attitudes and concepts, as well as skills in a specified area of study would provide a needed model for education of the gifted and talented. This relationship can be developed over a period of time in which a mentor and student(s) can interact by way of several forms of telecommunications. The approach to be used includes the possibility for privileged communication which is most conducive to a successful mentor - student relationship. The only "monitoring" that will be done will be that necessary for insuring a smooth operation of a technical nature and/or the answering of questions posed by the students in relation to the operational problems and the evaluation of the total effort.

The major forms of communication to be used will be computer conferencing which will take place every two weeks, augmented with two video teleconferences and additional audio interaction when requested. The small group model is expected to increase the level of motivation to interact with the mentor, allow for peer identification and interaction, develop the skills of interaction in a similar interest group, and develop a spirit of cooperation and camaraderie among gifted students of similar interests.

The assumption upon which the mentor program is based is that specific elements must be present to guarantee success. To be successful, a mentor program must include the following:

- 1) A commitment from the mentor and from the student must be firm and stable;
- 2) The mentor must let the student learn in his own way;
- 3) The relationship between the student and the mentor must be privileged, that is, it will not be structured by anyone else, such as a classroom teacher or administrator;
- 4) The mentor teaches from the world to the student, through his experience, derived from choice by the student and the mentor;
- 5) The education must be open-ended; and
- 6) The education must be competency-based.

The initial awareness training of the mentors which will be conducted by project staff will be based on developing an understanding of these elements.

Given the advantages of the mentor program, it is the goal of this program area to provide gifted and talented students with enrichment experiences using a "mentor program" presented via a telecommunications mode.

2. Design of the Mentor Program

The mentor program will be designed to foster a close relationship between the mentor and among the small group of students (two to four) who are working in the same interest area. During the first year of the project, four interest areas which have been chosen by the project staff in consultation with gifted student educators will be developed. During the second and subsequent years, 10 mentor

groups will be maintained. A mentor in each interest area will be trained in computer conferencing and in the concepts basic to a mentor role. Students will also receive training in computer conferencing and in goal setting, questioning techniques and in expectations of the student role in this type of program.

The computer conferencing which will be the basic telecommunications system, can take several forms. The most probable will be the following three types of computer conferencing developed by the Institute for the Future. The *seminar* type will enable the mentor to transmit background information to students; the *encounter* type will provide the means for discussion; and the *notepad* type will provide for informal comments between the bi-weekly (twice a month) formally arranged seminar and encounter sessions.

The program will achieve a balance between audio teleconferencing, computer teleconferencing and video teleconferencing. Time for video teleconferencing will be based on the request of the individual mentor group. Audio teleconferencing will also be used to eliminate any possible feelings of alienation stemming from using a "machine."

3. The Role of the Mentor

The mentor will provide the catalyst and model for investigation of the specified common interest of the students in the mentor group. The mentor can require an appropriate level of active investigation between the telecommunications with the students. During the second and subsequent years, 10 mentor groups will be participating in the program. This will involve 10 mentors and 20 to 40 students.

The mentor must possess several traits essential to the success of his/her serving as role model. A mentor should first be an advocate of a way of life and a model

of what a student can become. The mentor must also have a sense of timing and a willingness to plan guided experiences.

A successful mentor will have an equal interest in his/her vocation and in young people. A mentor should develop the sense of "being a mentor", a role which requires a desire to better the world by working with the young and a posture reflecting the "self-actualized" person as described by Maslow.

4. Criteria and Process for Selecting Mentors

For the first year of operation, mentors will be selected by means of consultation with gifted and talented student educators. The selection criteria are more fully discussed in the Narrative of Direct Services to Gifted and Talented Students, page 120. Students identified as gifted or talented will be given an interest inventory. Prospective mentors will be contacted on the basis of an analysis of these inventories and the recommendation of persons both in respect to their expertise and in respect to their interest in young people.

During the first year of the project, the mentor program will be designed to test the appropriateness of the planned operations. Suggested mentors were interviewed by telephone after receiving a detailed account of the expectations of the role. Suggestions were received from key persons in the three selected areas during the planning period for the proposal.

5. The Role of the Student

The student role will be two-fold. The student will be asked to adapt the role of an apprentice in relation to the mentor. A special relationship will also be developed among the two to four students assigned to one mentor. The students will also

be trained in creative thinking and questioning techniques. This role will also include a commitment to learning and responding to requests from the mentor.

6. Criteria and Process for Selecting Students

Before students are selected for the program, teachers will be trained by project staff to observe students to detect giftedness and recognize talent and creativity. There will be a concerted effort to find gifted handicapped and gifted minority students.

Achievement in school subjects, standardized test scores, and observed behaviors will be combined with student interest in a mentor program to form a composite picture of each suggested student. Selection procedures for students are detailed on page 122.

7. Development of Interest Areas

During the first year of the project, four interest areas will be developed. These interest areas may be physics, creative mathematics, telecommunications and creative writing. These areas were chosen because of their interest to junior high school age students and because mentors were accessible in these areas. In the first months of the project, print materials will be provided to potential student participants in the project who have exhibited an interest in these four interest areas. This will provide students in each interest group an opportunity to start the program with a common base of knowledge. The materials will be selected on the advice of the mentor. During these months, students will be trained in computer conferencing techniques by the use of role-playing and simulation by the project staff.

Each interest group will consist of a mentor and from two to four students. The students may be from any of the three states participating in the project. They

will work as a small group with the mentor, at times work individually with a mentor, and at times work together without the mentor. From the camaraderie developed by this organization, students on their own initiative, will be encouraged to extend their communication and learning experiences beyond the scope of the project.

After the first year of the project, the interest areas will be developed on the basis of an inventory given to students identified as gifted and talented in the schools within the 20 districts. As in the first year, the second criteria for the selection of interest areas will be the availability of mentors in the identified interest areas. Interest areas that are developed in the second and subsequent years of the project can involve a greater number of video communications when the nature of the interest area demands visual observation either by mentor or students.

8. The Future of the Mentor Program

The development of mentor programs for gifted and talented students is of high priority at the National Office of Gifted and Talented. Using a satellite as an enabling vehicle of communication will make possible a unique approach and broadened opportunities for mentor relationships for students with people who are highly successful in specialized areas. For the second and subsequent years of the project, additional funds will be sought from foundations and other funding groups. Business, industry and individuals will be asked to contribute mentor time and, perhaps, in some cases, to contribute computer time and terminal use to enable project staff to increase the scope of the program.

Community Awareness/Parent Education

1. Rationale

It is clear that one of the intents of the Congress in the passage of P.L. 94-142 and Section 504 was to eliminate discrimination of handicapped children and adults that today occurs in varying degrees in all aspects of American life. Students of these discriminatory practices have pointed out that many citizens possess negative attitudes about the handicapped that reflect insufficient factual information, fear, and stereotyping. The presence of such attitudes, particularly if left unattended, could severely limit for an unknown period of time the implementation of these laws, which of course means the illegal continued denial of opportunity for handicapped individuals. This is particularly important today for handicapped citizens are increasingly appearing and participating in activities and environments in which they have never been before. This is especially true in relation to publicly sponsored programs and especially with regard to handicapped children in regular classes and other school activities with their non-handicapped counterparts. Recognition of the need for addressing public awareness and community education about this vulnerable population and the massive potential of the audiences that can be effectively reached with a well designed and well programmed telecommunications system has led to proposing this program area for inclusion in the Special Education Satellite Project. The specific goal for this program area is to increase community awareness regarding the characteristics, needs, rights and abilities of handicapped and gifted individuals as well as provide parents of exceptional children with education designed to facilitate their effective participation in their children's educational/development process by utilizing a combination of appropriate telecommunications delivery systems.

Yuker (1977) has said that.

... attitudes may be thought of as positive or negative emotional reactions to an object, reactions that are accompanied by specific beliefs and that tend to impel the individual to behave in specific ways toward the object of the attitude.

He goes on to say that attitudes have components of beliefs, emotions, and action and that people's attitudes have been acquired as a result of things heard and things experienced.

Data on the effects of information on handicapping conditions has indicated that a positive change of attitude and an increased acceptance of persons with handicapping conditions has occurred only about 50 percent of the time that information about handicapping conditions has been presented (Yuker, 1977). There are, however, factors that influence the effects of positive change in attitudes toward the handicapped individual. Some of these factors are:

- o presenting both positive and negative facts;
- o spoken word presented from one person to another;
- o the credibility, attractiveness, and power of the person delivering the information; and
- o personal contact between individuals in settings not associated with the disability, i.e. a "normal" environment.

Recognition of the importance of providing the public with information was emphasized in the Kentucky State Report (1977) on the White House Conference on Handicapped Individuals, which suggested that one way of breaking the attitudinal barriers that interfere with the development of education and other programs for handicapped children is to promote widespread use of mass media to provide information about handicapping conditions to the general public with an emphasis on the skills and abilities of those with handicaps. Specifically, the participants at the Kentucky White House Conference adopted the following statement:

HOW CAN THE MASS MEDIA PROMOTE POSITIVE ATTITUDES TOWARD HANDICAPPED PERSONS?

1. Appoint national, state and local advisory groups to take action with mass media groups to increase an accurate image of handicapped individuals.

Objectives:

- (a) Increase positive visibility.
 - (b) Decrease stereotyped image of dependency and depicting of handicapped as criminal, degenerate, or objects of pity.
 - (c) Increase coverage of handicapped persons in the media.
 - (d) Educate mass media personnel to positive aspects of handicapped persons.
2. Promote television programming (shows, advertising, documentaries) which includes and portrays handicapped people in normalizing ways.
 3. Change the focus of reporting on handicapped persons to identifying the person first and the handicap second.
 4. Increase usage of signing for deaf persons and give more attention to the quality of sound tracks for the blind.
 5. Encourage mass media to cover handicapped persons active in civic affairs.
 6. Publicize positive beneficial programs designed to meet needs of handicapped.
 7. Employ handicapped people in mass media (Kentucky State Report, 1977).

The issues of information needs about handicapped individuals that arose from the full White House Conference on Handicapped Individuals resulted in an Information Seminar conducted June 28 - 30, 1977 at the Office for Handicapped Individuals (OHI) Clearinghouse on the Handicapped. Further exploration of this subject resulted in a preponderance of statements regarding the responsibility of public and private agencies to meet information needs of the public concerning handicapped individuals. The following statements represent a sampling of some of the public awareness needs that came out of this seminar:

1. PUBLIC EDUCATION PROGRAMS

Media cooperation should be encouraged in conducting public education programs that portray handicapped persons positively and realistically, use disabled persons as actors, develop TV documentaries that are positive, life-like, and depict discrimination faced by handicapped persons in various life situations.

2. INCREASE AWARENESS

Public awareness of the need for recreational opportunities for handicapped persons should be increased through workshops and demonstration projects, informational and educational programs, use of TV to show handicapped individuals engaging in normal recreational activities, publicity of successful programs (Theatre of the Deaf), and local newsletters.

3. PUBLIC AWARENESS

State and local education agencies should develop systematic processes to inform public about coping aspects of special education, emphasizing parents' rights and producing documents for public utilizing newspaper, radio, TV media, Speaker Bureaus and consultants. The State Educational Agency should provide all local school boards with information regarding legislation relevant to handicapped; stress skill and abilities of handicapped; and make audiovisual materials available through libraries, community groups and PTA meetings, churches, etc.

Public and private agencies should conduct public awareness campaigns supported by tax deductible contributions and/or by public funds.

4. FEDERAL PUBLIC INFORMATION ROLE

The federal government should support a variety of efforts designed to promote greater public awareness and acceptance about handicapped individuals.

The need for these types of activities is clear. Worthy of emphasis as well is that there is research evidence to support the feasibility of the utilization of media to effect attitude change in the non-handicapped population. One effort, for example, was a tightly controlled study performed by Donaldson (1974), which examined the effectiveness of alternative delivery systems. Four groups of non-handicapped subjects participated in this investigation. The first group observed a live presentation by a panel of physically handicapped individuals. The second group watched a video taped presentation of the same panel. Group three listened to an audio tape of the source material; while group 4 served as a no treatment control. All subjects were randomly assigned to treatment conditions and were administered the Attitude Toward Disabled

Persons scale following their participation in the study. The results indicated that there were no differences between the attitude scores of those who viewed the live and video taped presentations. All three groups (live, video, audio) showed significantly more positive attitudes than the control group. Both the live and video groups showed more positive attitudes than the audio group.

This study supports the contention that video taped programming and, to a lesser extent, audio programming can be used effectively to modify attitudes that non-handicapped people have toward disabled persons. Consequently, this provides additional rationale and support for the activities proposed in this program component.

2. Design of the Program

The community awareness component of this project will develop a program over the four years designed to incorporate factors known to change attitudes of the general community toward persons with handicaps in a positive way and to meet the stated needs of handicapped persons for acceptance into the mainstream of society. It is felt this can best be done with the use of mass media, such as TV and radio for the dissemination of such information. These programs could be delivered through commercial stations, cable TV, public broadcast stations (PBS network), educational radio or instructional TV networks. The use of satellites will significantly increase the number of homes into which this information can be delivered. At this particular time, the RCA/CATV network is seen as offering the greatest opportunity for this community education component. Two hundred, sixty-one private cable companies are connected to the RCA Satellite system and this number will increase over time as the demand for CATV increases. The commercial broadcast stations would require program costs that would be prohibitive to this component. ETV certainly represents another delivery system, but at present, it is difficult to obtain prime time on this

network due to the time committed to children during the day and education programs in the evening.

Also, the audience for ETV represents a limited population, and one goal of this program area is to reach the largest possible audience. Some of the ETV stations are currently connected to the WESTAR Satellite system, but the number of transponders and possible delivery systems is less than that of the RCA/CATV network. However, outlets such as ETV will be considered, and it is projected that the PBS system will be included in delivery in the second project year when the outreach sites will be increased. For the first project year, it is proposed that three programs will be delivered over the RCA/CATV network.

Local Community Outreach. The impact and involvement at the local level is the most important part of this community outreach component if effective change is to be implemented. It is felt that much of what is done on the local level will be the option of those citizens who are concerned with the issue to be aired.

Two other program series whose objectives have included local community education and community outreach have utilized a combination of audience participation-interaction procedures.

- o Documentaries: The Puzzle Children and Including Me, TV shows designed to raise public consciousness about the needs of children with handicaps. Many public broadcasting stations conducted a follow-up of local TV programs, (films, panels, call-ins, write-ins) to help viewers find services for their children.
- o Inside/Out Series: "Inside /Out" is a series of thirty 15-minute color programs designed to help eight to ten year olds achieve and maintain well-being. The programs and related materials were created, under the supervision

of the Agency for Instructional Television, through the resources of a consortium of thirty-three educational broadcasting agencies with additional support from Exxon Corporation. This series was presented by ETV stations for parents and other community members to see and to react prior to their being shown in the classroom. The series is accompanied by a teachers' guide and a "Community Actions Kit." This kit is essentially a "press kit" designed to help secure publicity necessary to gather vital support for the "Inside/Out" program. It also outlines ideas for local action programs to directly involve an agency in activities to encourage community understanding. Although the "press kit" designed for the "Inside/Out" series contains many fine ideas on publicizing issues in the local media, it does not attempt to provide information on audience participation activities such as call-ins or write-ins or offering further resource information to the public. It also does not discuss issues such as use of volunteers in evaluation procedures.

The two community outreach programs mentioned above were considered valuable and productive by those who were involved in their conception and presentation, but it seems that very little was done (except for the "press kit" mentioned previously) in the way of presenting the concept in a handbook or guide for others to use in community outreach programs. Little research was done to show the impact of these programs nationally or locally except to collect numbers and informal reactions.

Much informal information is available on methodologies that have been used in this type of community outreach. A compilation of this information into a guidebook for community education outreach, a how-to-do-it manual, could facilitate the process of community change through the media. A press kit, such as the one distributed by the "Inside/Out" series producers would be a valuable part of or a companion to such a handbook.

It is felt that guidelines for community outreach involving media and audience interaction will greatly facilitate the involvement at the local level and thus increase the probability of changing the attitudes and increasing the awareness level of the average citizen on the facts of handicapping conditions and the persons who have these disabilities.

Closed Circuit. During the second year of the project a parent education component is planned that will focus on the delivery of interactive parent education programming through closed circuit television toward parents of exceptional children to facilitate effective parental involvement and participation in the educational process. P.L. 94-142 has mandated that parents be jointly involved in decision making about their children with the schools through the referral and evaluation, educational placement, writing of an individualized education program (IEP) to the implementation and monitoring of their child's education plan. In order to participate effectively in this process, parents will need basic information and training in areas that affect the quality of their children's education. Such education could include programs on rights of handicapped children, Federal and state, specifically rights and responsibilities under P.L. 94-142, due process procedures, placement alternatives, value of psychological and education tests, and effective participation on placement committees.

For the parent education component, the RCA/CATV system could also be used to deliver closed circuit programs to parents by utilizing the conference rooms located at the cable stations. The PBS network and instructional TV networks will also be explored as possible sites for parent-education programs.

Parent Education - National Broadcast. During the third year of the project, a series of six parenting programs are proposed. These are to be delivered into homes and group sites over the national network developed during the first

project year. This component will cover subject areas such as the following:

- o available diagnostic and auxillary services;
- o new technology;
- o basic information on physical care of young children, pregnancy and childbirth;
- o prenatal hazards and available services;
- o range of normal development, physical, mental and social;
- o abnormalities -- physical, mental; information, advise and ways of coping;
- o general parental skills and duties;
- o mutual interaction between parents and children -- social, emotional growth;
- o others -- according to expressed needs of consumers.

The delivery of such programming will have impact in many ways. It could aid in the prevention of handicapping conditions, both pre and post natal, the early recognition of a handicapping condition, which would result in earlier physical and educational intervention, at whatever age the condition occurs, as well as improving the skills of all parents in fulfilling their roles as effective parents.

P.L. 94-142 has established procedures for identifying handicapped children, and many of those screening programs are being mandated by various state and local laws (Whitehouse, 1977). Whitehouse has also stated that early recognition and early diagnosis are the two steps to early intervention and that, "... the basis of early recognition is awareness of the unevenness, or differences in function, of an individual compared with the 'norms' for that age and social group." He feels that, "... parents are clearly in the front line for early recognition..." and as such a prime need for parent and prospective parents is education for both preventive and therapeutic intervention procedures.

Murphy (1969) also states the need for adequate parental information in areas of nutrition and child care vital to normal development of children in order to prevent retardation.

According to a report on the Needs of Children in Kentucky (1977), which originated from a special committee established to study the needs of Kentucky's children from prenatal to age eight, numerous gaps in service exist. Among the gaps in service were the following:

- o lack of a public information and referral source regarding available services;
- o lack of education programs in child development, family life and parenting.

These gaps elicited the following recommendations:

- o courses in child development, family life and parent education should be offered in grades 7 through 12, in colleges, and in adult education programs;
- o provide public information and referral program.

The national parent education component is seen as having multiple impact and is of interest to a varied population ranging in age from junior high students to parents of adolescents and young adults. The topics delivered can range from planning for parenthood to basic parenting to dealing with abnormal conditions and attitudes. It can also help to identify populations of handicapped individuals that are not currently being served.

II. ALTERNATIVE APPROACHES

ALTERNATIVE APPROACHES

A. Analytical Elements

As part of the activities conducted during the planning phase of this project, specific consideration was devoted to not only what is technically feasible (available facilities) and the contents to be delivered (needs assessment), but also to the most appropriate and efficient means of linking the content to the users.

Recognition was given at the outset to the fact that the appropriateness of an educational application of telecommunications is dependent upon such factors as convenience and accessibility to users, acceptability to users, training required for effective use, and the suitability of a particular medium to particular educational content. Communication media can play many different roles in instructional systems (Short, et al, 1976). Selecting the medium for the particular use may be approached from at least two viewpoints:

- Exploration - Given a particular medium, to what various uses is it suited?
- Analytical - Given the content and the effect to be produced (the objectives to be achieved) what principles and combinations of technology, content and users, are required to produce successful outcomes?

In practice, the first approach has been the most commonly used, particularly in the case of new media whose capabilities are not always well known. This approach is often characterized as a "solution looking for a problem": a distribution system is installed by an institution, and someone is put in charge and directed to explore and develop its uses. The second approach requires prior analysis and planning such as that which occurred during this project. The overall purpose of

the communications system is identified and described, the roles of communication at various points in the process are determined, the requirements for telecommunications are defined, and suitable media-content-user alternatives are deduced.

The analytical approach is used to determine:

1. What principles or strategies underlie the successful use of instructional media;
2. What techniques or "tactics" are most effective in different media-user situations;
3. Which combinations of media, content and users are most appropriate to achieve desired objectives; and
4. What additions to or technical changes in the delivery system will lead to increased effectiveness.

Use of the analytical approach builds upon research findings that indicate that while all medium are effective learning devices across a wide variety of content areas (Allen, 1971; Levie, 1975; Moldstad, 1974), it appears that particular media possess characteristics which make for more effective teaching of certain types of skills (Allen, 1959; Hartman, 1961; Travers, 1966). Travers (1966) and Hartman (1961) found that visual oriented materials were most appropriate for highly complex tasks, while the auditory mode was most effective for relatively simpler tasks. Allen (1959) concluded that one can best: (1) teach facts by television, motion pictures, filmstrips or slides; (2) influence attitudes, opinions and motivations through television, radio, or motion pictures; (3) teach verbal language skills by utilizing audio tapes and television; (4) teach computational skills through films,

filmstrips, or programmed instruction; and (5) teach concepts through films.

From the review of the literature then, several heuristic conclusions about the interaction between media type and type of learning may be drawn.

Audio:

Audio oriented media are best suited for the presentation of verbally oriented material which requires two-way communication, immediate feedback and/or audience participation. While it has been found to be effective in the teaching of facts it appears to be most effective in promoting attitude change, cooperative problem solving, participation in highly controversial and embarrassing topics and in presenting expert opinion(s) to audiences in scattered geographical locations.

Visual:

Both slides and filmstrips are compatible for conveying information about tasks involving chaining and verbal association. Filmstrips and still slides are most effective for material that can be broken into discrete sequential steps, such as perceptual motor tasks; recall of factual information, and concept acquisition.

The properties of the overhead transparency suggest it to be most effective in displaying sequential development and interrelationships between parts and wholes. Additionally, overhead transparencies facilitate the following of directions, and the learning of written language skills.

Motion pictures have been found to effectively teach facts and aid in the acquisition of concepts. In the affective domain, motion pictures have been found to change specific attitudes and promote motivation to learn. Continuous loop films have been

particularly successful in teaching perceptual motor skills. In general, films appear most appropriate in presenting information dealing with action or activity.

Because television shares most of the stimulus properties of motion pictures, it also serves as an effective medium for teaching visually oriented content, recall, perceptual motor skills and affective learning. As communication technology allows for two-way communication between the television presented and the television audience, television learning will also share some of the response properties of the telelecture. This will not only greatly improve the effectiveness of television, but also expand the domain of skills to be taught via television.

Programmed Instruction and Computer Learning:

Programmed instruction and computers are designed to teach tasks that require sequential mastery of prerequisite skills leading to mastery of a terminal behavior. Though initially developed to teach skills that correspond to the lower level types of learning in Gagne's hierarchy, programmed instruction has branched out to include concept formation, problem solving, principle learning, deductive thinking, perceptual-motor skills and interpersonal relations.

Multimedia:

Though the debate about the superiority of single-channel versus multi-channelled learning continues, multimedia instruction has been shown to aid in the acquisition of facts, perceptual motor skills, and problem solving abilities. Multimedia has also been a vehicle for the changing of attitudes.

Due to the scarcity of empirical findings in this area, educators are forced to use their own intuition and engage in an analytical planning sequence in selecting the appropriate media-learning type match. The initial stage in this process is to identify the type of learning required by the terminal objective. This is best accomplished by behaviorally stating the terminal objective and identifying and sequencing the salient features of the task. Once the task analysis is completed, the enabling objectives should be examined to specify which type of learning is involved in mastering the subtasks. With the types of learning identified, the next stage is to match the persons involved, the situation, the subject matter and the media (Williams and Stanford, 1976).

As indicated, consideration of alternative media along with their strengths and weaknesses is only one component of the analytical approach. Also to be given weight are the implications of group versus individual involvement. Consideration of the individual as distinguished from the group required definition of their needs, environments, attitudes and perceptions. Identification of these characteristics plays an important role in determining the reasons for specific success and failures, in redefining the means used for attaining project objectives, in measuring the degree of change that takes place and in obtaining some indication of the durability of effects. These aspects of the selection process are crucial because in fact, the "measure of performance" is the user which means that these aspects constitute the highest form of "authority" in the selection of media, programs and associated procedures. Consideration of telecommunication applications for groups recognized that such communication not limited to two-person (dyadic) communication, but that various forms of group interaction (e.g., the tele-classroom) may be used. If the "group" is at one end of a telecommunication link and the instructor at

another, the perceptions, attitudes and media sensitivity to the task may be significantly different from geographically dispersed classes, one of which is in face-to-face contact with the instructor.

Another area of concern requiring considerable analysis is the relationship between the medium and the application.

The impact of the medium and its use on the effectiveness with educational programming can be considered the technical side of the human-machine interface. Two groups of concerns predominate, the physical properties of the medium - bandwidth, symmetry of channel (e.g., one-way, two-way), access - and the communication properties - form, duration, cost. Finally, the specific task or function of instruction will often be sensitive to the medium or media used. This sensitivity to medium has been acknowledged in research of interpersonal and group communication using telemedia (e.g., teleconferencing) and has been shown in research studies to affect both the behavior of communicators and the perceptions or attitudes these users have - both toward the task and the medium (Short, 1976; Connors, 1976).

With our identified "target area variables", "programmer content variables", and "technological or system variables" in mind, a matching process of these elements initiating from the user occurred with the essential goal for the entire project being to provide services to children, teachers, administrators, and parents. Therefore, a delivery system into schools and homes was required. Both narrowband and wideband media were indicated for accomplishment of the required tasks. Small audiences in general, as opposed to the broader community, were anticipated for most applications. The discussion of the delivery systems follows.

Delivery Systems

The Special Education Satellite Project (SESP) has conducted a review of delivery systems. This has been done in consideration of the target audiences, the program area content objectives and the technological considerations inherent in the project. The evaluation and discussion of such existing and planned commercial and experimental telecommunications delivery systems is presented according to the following outline.

I. LOCAL/REGIONAL DISTRIBUTION SYSTEMS

- A. Instructional Television Fixed Service (ITFS)
- B. Community Antennae Television (CATV)

II. NATIONAL DISTRIBUTION SYSTEMS

- A. Existing Experimental Satellite-Based
- B. Existing Commercial Satellite-Based
 - 1. AT&T (COMSTAR) Satellite System
 - 2. Western Union (WESTAR) Satellite System
 - 3. RCA (SATCOM) Satellite System
- C. Planned/Proposed Satellite Systems
 - 1. Satellite Business Systems (SBS)
 - 2. Hughes SYNCOM IV
 - 3. Tracking and Data Relay Satellite System
TDR SS/WESTAR II
- D. Landline-Based National Networks
- E. Computer-Based Network

I. LOCAL/REGIONAL DISTRIBUTION SYSTEMS

Regional distribution systems of open circuit VHF/UHF are generally single channel systems, expensive to operate, rigid in scheduling, requiring broad audience appeal. Further, it is anticipated that portions of the content would not lend themselves to

open circuit delivery. Multipoint Distribution Service, also single channel, is currently primarily devoted to ground distribution of commercial Pay TV.

On the other hand, the multichannel capability, low cost, limited access nature of Instructional Television Fixed Service (ITFS) and Community Antenna Television (CATV) lend themselves to the tasks, learners and environment being considered.

A. Instructional Television Fixed Service (ITFS)

Instructional Television Fixed Service (ITFS) is a special band of television channels reserved for the exclusive use of educational institutions, and was first established by the Federal Communications Commission in 1963 to respond to the needs of instructional television for multi-channel transmission capability at costs considerably lower than conventional VHF or UHF television. ITFS operates at frequencies higher than those used by "standard" television. For this reason, special antennas and converters must be installed on each building which is to receive ITFS. This equipment converts the transmission to signals which can be received by ordinary television receivers. When viewed in the classroom, ITFS looks like regular kind of television.

The purpose of ITFS is primarily to provide a means for the transmission of instructional and cultural material for the formal education and cultural development of students enrolled in accredited public and private schools. In addition, such stations may also be used for transmitting visual and aural material to selected receiving locations. The material is to be used for in-service training and instruction in special skills and safety programs, extensions of professional training, informing persons and groups engaged in professional and technical activities of current developments in their particular field, and other similar endeavors.

ITFS has several unique characteristics:

- o Time efficiency - it can broadcast programming in the content areas specified above around the clock.
- o Regional usage - it is especially adaptable for regional use.
- o Flexibility - provides multichannel system enabling administrator to cope with short-notice scheduling problems.
- o Repetition - programs may be repeated whenever required, and up to four different programs may be transmitted simultaneously by one station.
- o Economical - it is relatively economical to use.

ITFS can be viewed as an over-the-air closed circuit system. Each receiving site must have a special microwave receiving antenna and "down converter" to receive the signal. ITFS also offers an opportunity for low-cost multiple channel television distribution. Live interchange between teacher and student is permitted through a special group of radio frequencies that may be utilized for audio or data response to the television program. It also offers the possibility of computer-managed television instruction as well.

Another advantage to ITFS is its cost. The cost of ITFS transmitters and transmitting antennas is considerably less than that of standard television broadcasting equipment.

In addition, at present, ITFS is restricted to instructional uses. Thus, a school system, college, or community educational association has a ready-made, reserved place in the telecommunications spectrum for its exclusive use.

In March 1976, there were 83 institutions operating 161 ITFS licenses in the United States. An additional 25 institutions had been granted FCC permits to construct ITFS facilities, and 13 more had made applications which had not yet received FCC approval.

A survey conducted by NAEB in the spring of 1975 compiled data from 68 of the 83 institutions holding licenses. They reported reaching an audience of 1,750,000 students during the 1974-1975 school year, with each system averaging 4,360 hours of programming. Public and private elementary, junior high, and senior high school students comprised 92% of the viewing audience. Other significant groups using the service included medical professionals, business and industrial executives, and engineers and scientists enrolled in continuing professional education courses. Over half of the systems reported that they transmitted their programming in color (NAEB, (National Association of Educational Broadcasters) 1976))

ITFS systems linked by a satellite is currently being demonstrated by Project Interchange in California. Project Interchange uses the Communications Technology Satellite (CTS) to link classroom teachers in the Archdiocese of San Francisco, and the Torrance Unified School District with resources in Santa Clara County (San Jose) and San Diego County.

ITFS is particularly well-suited to reducing the "final mile" problem so endemic to satellite delivery.*

The Archdiocese of San Francisco, a member of the planning consortium, is a NASA approved experimenter on the CTS. (See enclosed approval for Year # Two operations.) The Archdiocese's first two years of experience with the CTS are outlined in the appended reprinted article from Educational and Industrial Television in Appendix C.

In the San Francisco Bay Area, Project Interchange is able to distribute the signal from one CTS receiver, perhaps originated 3,000 miles distant, over a 1,500 square-mile coverage pattern to schools, hospitals and other locations.

* The effectiveness of satellite delivery over great distances is often thwarted at the end point by the inability to transfer the signal at the satellite receiver to the end user often only a few miles distant. Often it is necessary to contract with Bell System for point-to-point microwave service at very high cost to make the "final mile."

B. Community Antenna Television (CATV)

There are approximately 3,400 CATV systems in the United States, serving approximately 7,700 communities and 11 million subscribers.

Cable technology enables the provision of many wideband channels, normally 26 channels in most major market systems, to the ultimate user--individual, school, or community center. The large number of channels permits programming to smaller audiences--"narrowcasting." The technology also permits, in many cases, interaction by the subscriber, i.e., a return to studio--"upstream" transmission; two-way communication to and from the studio.

Much has been written since the late 1960's on the possibilities inherent in CATV technology. It is sufficient here to say that the technology itself, in its linking via satellite, and in the interface with computer systems, holds great promise for delivery of service to the target audiences and provides an important area for comprehensive exploration in the planning phase.

II. NATIONAL DISTRIBUTION SYSTEMS

A. Existing Experimental Satellite-Based Systems

The two NASA/Experimental Satellite Systems--Applied Technology Satellite (ATS), and Communications Technology Satellite (CTS). Because of the age of the ATS Series, and specifically ATS-6, and technical problems increasingly encountered with the space draft, NASA gives ATS-6 only a 60% probability of operations throughout October 1979. (Projected as the first year of operations of the project.)

The Communications Technology Satellite (CTS), launched in January 1976, is a joint effort by the United States and Canadian governments to improve synchronous orbit

satellite communications technology. The National Aeronautics and Space Administration (NASA) has responsibility for U.S. programs; the Department of Communications (DOC) has responsibility for Canadian programs. The satellite is used by the U.S. and Canada on a fifty/fifty, time-shared basis to conduct communications experiments.

CTS was designed to prove the feasibility of putting more transmitter power in space and thus make it practical to use smaller, more economical receiving and transmitting stations on the ground. It is the first satellite devoted to communications experiments at the 12 to 14 GHz frequency; it is the second satellite to be designed and operated in space that permits television reception with small ground terminals. The first such satellite was the ATS-6.

The 48 contiguous states can be covered by CTS with three distinct boresight locations (antenna pointings). One footprint covers approximately one time zone for the contiguous states.

The transponder, a combined receiver and transmitter, is located in the main body of the spacecraft. The transmit frequency (downlink) is 12 GHz; the receive frequency (uplink) is 14 GHz. The two CTS antenna systems are capable of receiving and broadcasting two frequency bands simultaneously. The two receive bands are higher in frequency than the two transmit bands. The two transponders are designed so that a signal received by one antenna will be translated in frequency, amplified, and transmitted by the other antenna. Both antenna dishes can be steered from the ground, and so focused on ground stations as necessary. Combining antenna pointing with the use of both transmit bands permits two-way video communications between widely separated earth terminals.

An interesting aspect of the CTS program is the utilization of portable/transportable earth stations to permit short term demonstrations. Portable/transportable terminals are operated by a number of experimenters. Utilization of transportable CTS terminals is planned by SESP. Transportable terminals have already enabled demonstrations in which the three organizations in the Special Education Satellite Project have been involved :

U.S. Conference of Mayors - A teleconference between a group of 20 major city mayors in Menlo Park, California, (Educational Television Center), with Patricia Harris, Secretary of Housing and Urban Development in Washington, D.C. (Portable Earth Terminal - PET), (March 1977).

The Council for Exceptional Children - A demonstration coordinated by the Public Service Satellite Consortium in support of the CEC annual convention (April 1977), where special educators in Baltimore, Maryland, Harrisonburg, Virginia, and Columbia, South Carolina, participated in the CEC International Convention in Atlanta, Georgia, (April 1, 1977).

University of Kentucky - A demonstration coordinated by the Public Service Satellite Consortium (PSSC) and Project Interchange that permitted Project Interchange staff and teachers in Menlo Park to communicate with participants in a conference on telecommunications and special education in Lexington (June 1977).

The CTS was used in the Special Education Satellite Project planning process to solicit input from classroom teachers, administrators and parents (February 23, 1976) as specified in our original proposal for the planning grant. It involved interchanges in four locations: Menlo Park, California, Torrence, California, Seattle, Washington, Lexington, Kentucky, and it was broadcast by project staff from Bethesda, Maryland.

B. Existing Commercial Satellite-Based Systems

1. COMSTAR

AT&T's Satellite System has been operating under service limitations in the Continental United States imposed by the Federal Communications Commission, therefore, research activity was concentrated on the WESTAR and SATCOM Satellite Systems.

2. WESTAR

The CPB/PBS/NPR public broadcasting satellite system will interconnect public television and public radio stations via WESTAR and replace the present terrestrial interconnection. The public television satellite system, which will be fully operational by 1979, is composed of four distinct parts:

- a. Four CPB-leased transponders on WESTAR I;
- b. A main origination earth terminal near Washington, D.C.;
- c. Initially four (later more) regional transmit-receive terminals within the continental United States;
- d. 150 receive-only ground terminals located at public television stations.

Procedures for use of WESTAR and public broadcasting satellite facilities are in the process of development. Procedures will include:

- o Arrangements between public broadcasting station licensees and public service organizations who want to use the system.
- o Provisions for use of facilities available at public television stations, Western Union uplink sites, satellite access cities, and other locations that can support shared use of the system, e.g., conference rooms, videotape recorders, production facilities, CATV system, ITFS, MDS.
- o An FCC ruling that allows public service organizations to use the public broadcasting facilities for sharing purposes.
- o Provision for a preferred tariff for public service users.

The public broadcasting satellite system, in conjunction with other Western Union facilities, may provide an opportunity for public service users to expand their distribution of programs and services. Shared use of public broadcasting satellite facilities also may provide an alternative means of service delivery without requiring large front-end investments in facilities, equipment and hardware.

The Public Service Satellite Consortium, under contract to the Corporation for Public Broadcasting, is conducting a study which examines shared uses of the public television satellite system (PTSS) for non-broadcast purposes. Although the study is scheduled for completion in April 1978, preliminary findings from the study reveal that:

- o There is an identifiable need for non-broadcast uses of the public television satellite system.
- o There is assurance that existing constraints for non-broadcast uses of the public television satellite system can be resolved.
- o There is consensus that a management agency to coordinate the use of non-CPB leased transponders will be necessary for effective use of the system.
- o Delivery of continuing professional education and delivery of mediated courses of study were mentioned most often as applications of the PTSS.

3. RCA

RCA American Communications (Americom) currently offers satellite services to the Department of Defense, has a major commitment to NASA in conjunction with the Space Shuttle, provides various services to the commercial networks, provides substantial services to the CATV industry, and has recently established a Federal (non-NASA, non-DOD) Service Component within RCA's Government Services Department. RCA has continued liaison with public service organizations through site visits, participation in conferences such as PSCS, and meetings with various Federal agencies. RCA has conducted various demonstrations including a National Network of CATV and ITFS systems in support of the United States Catholic Conference (Spring 1977).

In a series of interactions including face-to-face meetings, written communications and numerous phone communications, RCA demonstrated a willingness to work closely with the Special Education Satellite Project in development of its technical plan.

RCA is in the process of surveying its client CATV systems regarding interests and capabilities and has included questions developed by project staff in this communication, see Appendix D . RCA American Communications (Americom) currently serves 261 receive-only earth stations which are affiliated with CATV companies across the country.

Approximately 100 additional CATV companies have filed construction permits for terminals which are expected to be operational by the end of 1978. Existing networks can be viewed on the RCA Network Map included in Appendix E.

Until recently the primary intermediate organization coordinating RCA service to CATV companies was Home Box Office (HBO). HBO, following extended exploration of alternatives, recently signed a multi-year contract for multiple transponders with RCA. Recently, RCA signed a similar contract with Viacom for pay television services to other CATV systems across the country.

Explorations of RCA support for public service in addition to our own explorations have been undertaken by the Public Service Satellite Consortium.

C. Planned/Proposed Satellite Systems

Significant research efforts were devoted by technical staff to exploration of the new, emerging satellite systems including:

1. Satellite Business Systems (SBS)

A joint venture between COMSAT, IBM and Aetna Life Insurance, will provide wideband, switched, all digital transmission services using 12 to 13 GHz frequencies. The SBS system is intended to serve organizations requiring large communication networks heavy and dynamic loads using time division multiple access (TDMA) demand assignment techniques, without interconnection to terrestrial common carrier networks.

2. Hughes SYNCOM IV

In response to the Orbital Flight Test Mission opportunity of the shuttle, Hughes Aircraft has proposed a communications payload which may have capability to support public service users. Although a lengthy aggregation process was undertaken during the Fall of 1977, a public service capability has not yet been defined and Hughes may decide to proceed with one transponder for Hughes Medical Foundation and one transponder for the State of California.

3. Tracking and Data Relay Satellite Service (TDR SS)

The second generation of Western Union, Advance WESTAR, is under development to be operational in 1981 to replace the current WESTAR system ("C"-band) and also provide capability to NASA and others at Ku and S bands.

In addition, the Applications Division of NASA has currently undertaken a reassessment and redefinition of the satellite programs in which it will involve itself over the next period. Several concepts have been proposed including a Public Service Communications Satellite (PSCS), (Goddard) and a Large Deployable Antenna Satellite (LDAS) (Jet Propulsion Labs).

D. Landline-Based National Networks

Bell system-based wideband and narrowband services were researched including AT&T's Picture Phone Meeting Service (PPMS) and telephone conferencing system. In fact, the conferencing capability provided by the Bell System was used regularly by the Special Education Satellite Project in the planning process.

Various computer-based, special-purpose networks using the Bell System were investigated. Computer conferencing as a concept and system was researched at length.

E. Computer-Based Networks

SESP is indebted to Stanford Research Institute's "Teleconferencing Systems" for this overview of computer conferencing.)

Conferencing by computer is, in many ways, analogous to a telephone conference call in that each participant or conferee has his or her own terminal device, and may be located anywhere. In the case of telephone conference calls, the terminal is a telephone, and the mechanism that connects the conferees together is called a conference "bridge." In the case of computer conferencing, the terminals are teletypewriters or cathode ray tube (CRT) computer terminals. The device that connects these participants is a computer.

The medium of computer conferencing is text information--i.e., data to be transmitted are entered from a keyboard, stored and processed by the computer, and printed out in written form. The heart of the system is the computer. This device not only stores and processes entries as they are made, but retains a running transcript of the entire proceedings as it progresses. This feature separates computer conferencing from ordinary message switching, such as telegrams, TWX, Telex, or Mailgrams. These systems often store messages in switching computers until they are passed on to recipients. They do not, however, ordinarily retain the message after they have been "delivered."

For example, a computer conferencing system called "PLANET" is one of the available, operational, systems. The software for this system resides in a computer in Cupertino, California. This computer is owned and operated by Tymshare, Incorporated, a computer timesharing company that operates nationwide, in Canada, and overseas. The access to Tymshare computers is provided via the company's own special-purpose network,

called TYMNET. The Institute for the Future, located in Menlo Park, California, is the developer of PLANET. Operational applications of PLANET are coordinated by Infomedia. Infomedia has assisted the Special Education Satellite Project in the planning process.

The computer in the system acts as the intermediary between the participants. It records comments as they are typed in, automatically makes note of the originator of each entry and the time of entry, stores all entries in a common file in the order in which they are received, prints each entry on all the other terminals that are participating in a particular conference or activity, and provides other record or "housekeeping" services. A key feature may be surmised from this description: since the computer records the time of entry, saves all entries, and prints them only when users are "present", participants need not be present all at the same time. Computer conferencing then, can be carried on asynchronously as well as synchronously, thus again distinguishing it from audio (as well as video) conferencing.

The PLANET conferencing system allows communications from one-to-all (public messages) and between individuals (private messages). The CTS Experimenters have been major users of PLANET for more than a year. The data gathered from the CTS users demonstrates the value of the medium in management communications, particularly between geographically dispersed managers. The data also show the cost per public message to average approximately \$1.00 (70 to 100 words). This compares favorably with mailgrams at \$2.75 per 100 words, delivered the following day, not including a file copy; the cost of a letter at approximately \$4.50 for typing and mailing; or the cost of a phone call between San Francisco and Washington which averages more than \$1.00 for three minutes. Data on computer conferencing developed by Stanford Research

Institute (Teleconferencing Systems, 1977) project a decrease in cost of this medium of communications by a factor of two to three.

Summary

Based on research into the delivery systems, and cognizant of the uncertainties as to the future of the experimental satellite systems, project technical staff recommended the following:

- o An ongoing exploration of systems alternatives with developing satellite-based and other delivery systems should be established.
- o Because of the technical flexibility inherent in the CTS and the existing ground segment corresponding geographically with target audience, a limited program of service on the current generation of NASA experimental satellites, CTS in particular, should be established.
- o Computer conferencing is an important emerging medium and should be explored, initially on existing landline-based networks; transition to a satellite-based delivery system will be explored for implementation, if appropriate, in subsequent years.
- o National service application should be planned utilizing commercial satellite delivery systems. Only limited capability is expected to be available on the current generation of WESTAR satellites. Even given satellite capability the point of receipt, the PTV station, normally has available only a single channel for ground distribution-- a significant bottleneck for all but the broadest interest programming.

Project staff believes RCA offers the greatest potential in the 1979 to 1982 time frame for reliable, high quality service to large numbers of receivers interfaced with existing, multi-channel ground distribution system, for delivery to the maximum number of users at the lowest cost.

PROJECT PLANNING AND SCHEDULING

The Integrated Civil Engineering System (ICES) Project I Planning and Control Technique will be used to plan and schedule all activities in this project. The ICES was developed at the Massachusetts Institute of Technology to facilitate planning and scheduling for civil engineering projects (Daniels, 1968). This system has been adapted for use in special education projects by Blackhurst and Wright (1978).

The ICES is computer-based and differs from the Project Evaluation and Review Technique (PERT) planning and scheduling systems in two major ways: First, PERT networks are activity oriented, while ICES networks can depict both activities and events. This makes it easier for management to monitor project progress through easily identified milestone events. Second, PERT graphic networks represent the activities on arrows while ICES networks represent activities on nodes. Thus, ICES eliminates the need for dummy activities and start and finish circles. This simplifies the graphic event and activity networks and makes them easier to read and understand.

In applying the ICES to this proposal, a work breakdown structure was developed for each project component. This consisted of identifying the milestone events and activities necessary for the attainment of each event. Time estimates in calendar dates were made for the completion of each activity, constraints in the form of dates when critical events were required to occur or activities were to start or finish were also identified. These computer-generated tables specify the major events and activities for each context program area and component. They are shown in computer print-outs and included as a program area discussion.

Also included is a graphic survey activity and event network constructed for each project component. These show the sequence of activities and events, their inter-relationships, and constraints. The numbers on the network correspond to those in the work breakdown structures.

Upon completion of the networks, dates were entered into the computer via the ICES. Output is illustrated in the component schedules. These printouts indicate the early and late dates between which each event must occur to remain on schedule. For each activity, an early and late start and finish is computed, along with the amount of float for each activity. It represents the difference between the early and late finish. When float amounts to zero, this activity is identified as critical. Thus, the critical path can be identified.

A bar chart is also generated by the computer. An example of this is included in Appendix F. This is nothing more than a graphic representation of the same information that is presented in the other printouts. Only one bar chart is included in the Appendix for the sake of parsimony.

It should be noted that the activities listed in the computer-generated schedules for each program area or component could have been broken down into finer subdivisions. It was determined, however, that the level of specificity represented in those tables is sufficient to illustrate the project planning and scheduling. This level will also facilitate project monitoring by NIE staff. Furthermore, it should be noted that only the first year's activities are planned in detail, although the schedules run through the second year of the proposed four-year project. Greater detail for each succeeding year will be provided in the continuation proposal for that year.

IV
OPERATIONAL PLAN

A. PROGRAM COMPONENT

1. TECHNICAL ASSISTANCE PROGRAM AREA

This program area contains the following parts:

- o Work Breakdown Structure of Technical Assistance Program Area*
- o Narrative of Technical Assistance Program Area*
- o Project Framework: Technical Assistance Program Area*
- o PERT Chart: Technical Assistance Development Summary Activity and Event Network*
- o Schedule for Project "Tech Assist" - Computer-Generated Table.*

WORK BREAKDOWN STRUCTURE
TECHNICAL ASSISTANCE (TA) PROGRAM AREA

EVENTS	ACTIVITIES
1.0 Start Technical Assistance Program Area	1.1 Develop TA procedures and needs assessment materials 1.2 Train staff for TA procedures and needs assessment 1.3 Pilot TA needs assessment procedures 1.4 Schedule TA needs assessment visits 1.5 Distribute advance materials/"site package" 1.6 Conduct TA needs assessment site visits 1.7 Develop tentative TA agreements 1.9 Analyze and ratify TA agreements
1.9 TA Needs Assessments Completed	2.1 Identify existing appropriate media/materials 2.2 Acquire existing appropriate media/materials 2.3 Develop additionally needed media materials 2.4 Identify and contract for necessary resource personnel 2.5 Continue identification, acquisitions and development of needed media/materials
2.6 TA Materials Available	3.1 Schedule TA delivery for 20 LEA's in 3 states 3.2 Deliver academic year TA 3.3 Deliver summer TA 3.4 Evaluate effectiveness of TA 3.5 Revise TA procedures
3.6 TA Delivered	4.1 Develop marketing strategies 4.2 Develop marketing materials 4.3 Implement marketing with existing LEA's 4.4 Implement marketing with new LEA's 4.5 Implement marketing with SEA's 4.6 Implement marketing with other organizations
4.7 Marketing Implemented	5.1 Do second year TA needs assessments 5.2 Deliver second year TA to 40 LEA's in 6 states, 6 SEA's and 4 national educational organizations 5.3 Continue second year marketing activities
5.4 Second Year TA Completed	

NARRATIVE OF TECHNICAL ASSISTANCE PROGRAM AREA

The technical assistance (TA) component of the Special Education Satellite Project (SESP) contains the following objective:

To deliver specific technical assistance including inservice training to local education agencies and communities in appropriately educating all exceptional children and the implementation of P.L. 94-142 and Section 504 mandates via satellite as well as other telecommunications and non-telecommunications delivery systems.

In addressing the program/content portion of the objective, the expected results pertaining to its conduct have been identified and are described in the Work Breakdown Structure which precedes this narrative and in the Project Framework of the Technical Assistance Program Area which follows this discussion.

The technological tasks pertaining to the objective involved in the satellite delivery of the televised portion of the technical assistance are addressed in the Technical Component beginning on page

Rationale of Methodology

The integrating of handicapped children into the regular classroom or into, "the least restrictive environment" over the past 10 years, has been increasing. The catalyst for such movement has, in many cases, been P.L. 94-142; however, the trend began prior to its passage. Special problems have occurred among educational personnel at all levels. This includes classroom teachers, parents,

administrators, school board members, support staff and the community-at-large. Reactions to providing, "the least restrictive environment" have often been negative and have often been based on misunderstandings, a lack of knowledge and absence of specific skills needed to address the requirements of handicapped children.

Technical assistance, including inservice training, would assist the local education agencies to rectify this situation through implementation of P.L. 94-142 and Section 504. TA, if conducted effectively, meshes a combination of human and technical interaction to meet the needs and goals of the Local Education Agency (LEA) served. It is the development of these relationships in the TA communication process between the provider and recipient that can either increase or diminish achieving the objective or addressing the needs. The SESP, cognizant of both the human factors and technological possibilities involved in providing TA, has created a process for use in the project. It is a careful merging of human resources with planned use of satellite technology in a system designed to meet stated recipient needs in the implementing of P.L. 94-142 and Section 504 through the delivery of TA to local school systems.

1. Complete the needs assessment in each of the pilot LEAs and achieve a technical assistance agreement.

A needs assessment will be conducted in each of the selected 20 LEAs included in the sample. Local sites within the three pilot states of Virginia, Minnesota and California have been selected, screened and contacted. We now have letters

of committed interest from the Director of Special Education in the pilot states. These may be reviewed in Appendix A. Criteria for site selection are delineated in the Introduction on page

The needs assessment in each LEA will be conducted through an individual site visit of three days duration by the fully trained SESP staff member assigned to the particular LEA for the duration of the technical assistance relationship. Prior to the conduct of the needs assessment, certain tasks must be completed by the technical assistance program staff with the assistance of consultants affiliated with the SESP. These are:

1.1 Develop TA procedures and needs assessment materials. The procedures to be used in the provision of technical assistance and the tools to be utilized in the conduct of the assessment of the LEA's goals and needs will be developed.

The procedures for use in the TA staff's daily work must reflect a uniform process which can document the work performed and assist in the evaluation process. To that end, a procedures manual will be developed which sets forth in clear language the process and the documentation to be utilized in contact with the LEA and all resource providers and production/development of resources, provision of TA, subsequent follow-up and marketing strategies.

The needs assessment instruments will be developed within four weeks of project award. Outside consultants will assist TA staff in this process. To be effective in implementation, they will be designed to include at least the following components (Bartel, 1976).

- o Definition of the LEA's goals in implementing P.L. 94-142 and Section 504;
- o Assessment of the LEA's program needs (i.e., all the tools, procedures and resources needed to meet its goals);
- o Assessment of the LEA's program resources;
- o Determination of which program needs are unmet;
- o Definition of activity needs (i.e., all the tools, procedures and resources which must be developed to meet program goals);
- o Assessment of the LEA's activity resources;
- o Determination of which activity needs are unmet;
- o Determination of which activity needs require permanent resources and which require only temporary resources;
- o Determination of which activity needs can be fulfilled through the services of the TA agency.

These components will be designed to provide information to both the LEA and SESP on the particular needs the LEA has in providing appropriate education to handicapped children and implementing P.L. 94-142 and Section 504. Such identified need areas might include the following which pertain directly to P.L. 94-142:

- o Planning and Policy Development;
- o Procedural Safeguards;
- o Child Evaluation;
- o Individualized Education Program;
- o Educational Placement;
- o Management and Evaluation;
- o Personnel Development.

The "site package" will be sent to each LEA Superintendent at least three weeks ahead of the visit. The site package will include at least a definitive statement of the SESP Technical Assistance Program Area, its goals, services and modes of delivery, description of site visit process, guide for determining demographic data, documents/information required for needs assessment (i.e., local application for State funds), and suggested educational personnel with whom to meet.

1.2 Train staff for TA procedures and needs assessment. In this activity the technical assistance staff will be trained to work with the Superintendent of the LEA and other personnel in organizing and conducting the needs assessment. This training will include developing a trusting relationship with LEA personnel; recognition of unidentified needs and "hidden agenda" as well as overt needs; technological awareness to recognize which delivery systems (i.e., instructional t.v. vs. print vs. film, etc.) will best achieve the goals of the program; and developing a working knowledge of resources pertaining to the various sections of P.L. 94-142 and Section 504. Additionally, each staff member will be trained in the use of project developed audiovisual demonstration materials for use at the local site during the needs assessment.

The staff training will also include training in the Discrepancy Evaluation Model (DEM) which will be utilized as the evaluative mode for the entire SESP project. Although the evaluation will be conducted by SESP University of Kentucky subcontractor, it is important that SESP staff be familiar with the DEM model.

1.3 Pilot TA needs assessment procedures. The materials developed for the needs assessment as well as the skills/knowledge of the newly trained staff will be field tested in three LEAs within the Washington, D.C., area. The field test sites will

be selected on the basis of demographic characteristics, proximity to SESP headquarters in Reston, Virginia, (for cost and personnel effectiveness) and willingness to participate. A field test of the TA instruments and staff at one site in Virginia, Maryland and Delaware will be sought. This pilot test will be conducted prior to the actual site visits. Each staff member will visit a nearby school district and proceed with a mock needs assessment. The staff member will then draw up a mock tentative technical assistance agreement to deliver specific technical assistance services. Following the field test, the instruments and TA agreement will be evaluated and revised. The mock technical assistance agreement will be revised until the LEA Superintendent approves it as an accurate reflection of the LEA's needs in educating exceptional children and implementing P.L. 94-142 and Section 504. Any additional training thus identified as being required by the TA staff will then be conducted by the SESP staff. If even greater training is needed, an outside consultant will be brought in to conduct it. This will be done to ensure that the needs assessment instruments and staff are fully developed and prepared to perform the site visits.

1.4 Schedule TA needs assessment visits. The scheduling of site visits will be performed in a timely manner so that each LEA has adequate lead time to prepare and plan for the visit. As far as possible, the total schedule visits for each state will be conducted in a geographically sequential manner for personnel and cost efficiency. Three days at each site will be planned; the site visits will be performed in each of the three states, consecutively, and six weeks are allowed for their conduct.

1.5 Distribute advance materials "site package." All materials for the on-site assessment of each LEA which must be completed prior to the visit as well as the "site packages" described in 1.1 will be distributed to the Superintendents at least three weeks prior to the actual visit for adequate preparation time, review and planning.

1.6 Conduct TA needs assessment site visits. Each staff member assigned to the LEAs in a particular state will conduct each LEA's site visit. The staff member will draw up a tentative technical assistance agreement with the Superintendent of the LEA while on-site. The TA agreement will delineate the specific resource service to be rendered as it responds to a particular need for meeting a specified LEA goal in educating exceptional children. The potential mode of delivery of the resource will be determined at that time. All TA agreements will be tentative with the finalization coming after a review by the TA coordinator, technical engineer and project director. Each TA agreement will include at least the following components (MELRS, 1976).

- o Cover Sheet: identifies the agreement and has the LEA name. The TA staff member's name and places for signatures by the LEA representative and the SESP Project Director approving the agreement.
- o LEA Goal: relevant to the major goals and objectives of the LEA in educating exceptional children and in implementing P.L 94-142 and Section 504.
- o Technical Assistance Needs: indicate the area(s) in which SESP can provide service. Each need identified should reflect a problem the LEA is having in meeting its operational goal.
- o Technical Assistance Objective: establishes what SESP expects to accomplish in meeting the stated needs. In effect, the section becomes an operational objective of SESP's technical assistance program.
- o Technical Assistance Actions: clear and precise statements of what will occur, when and by whom to meet the objective. If also provides both the LEA and SESP with a readily available means of monitoring and evaluating the delivery process.
- o Technical Assistance Evaluation Plan: consists of both process and content evaluation and specifies a method for comparing desired outcomes with what actually occurred.

- o Technical Assistance Resources: refers to source and amount of resources which will be used during the delivery of technical assistance.

1.7 Develop tentative TA agreements. The tentative TA agreements will be developed by the SESP staff member while on the LEA site during the initial visit. It will be reviewed and tentatively approved by the LEA Superintendent and the SESP staff member. It will be understood that the agreement is tentative and subject to modification (as described next in subparagraph 1.8).

1.8 Analyze and ratify TA agreements. Following the site visit to each LEA during which the tentative TA agreement was drawn up, the TA staff review of all tentative TA agreements will include the following elements:

- o Analyze specific content areas of P.L. 94-142 requiring assistance in implementation;
- o Determine which areas within the law present problems which are common among the LEAs;
- o Determine which areas of the law are unique to specific LEAs;
- o Determine which resources are appropriate for use with particular identified need areas or problems; and
- o Determine which delivery modes are most appropriate for maximum LEA assistance, technological demonstration and cost effectiveness.

Following the staff review of the tentative TA agreements, modifications will be made reflecting the staff input. Any changes, such as providing assistance in Planning and Policy Development in a televised inservice mode rather than in

an on-site seminar mode at several LEAs will be reviewed in detail with the Superintendent of each LEA. Only after both the SESP and the LEA personnel agree to any modifications will the TA agreement be considered ratified.

2. Acquire existing or develop new media materials and identify resource personnel necessary for fulfilling technical assistance agreements.

This objective is concerned with the acquisition and/or production of all materials to be used in providing the LEAs with technical assistance. This involves both content, format and delivery mode development.

2.1 Identify existing appropriate media/materials. Initial identification of media and print materials (instructional, awareness or skill development) has begun with the planning phase of the project. Media and print resources have been identified relevant to specific special education content areas. For example, content areas which we anticipate may be identified in the needs assessment include, but are not limited to: 1. planning and policy development; 2. procedural safeguards; 3. child identification; 4. individualized education program (IEP) development and implementation; 5. educational placement; 6. management and evaluation; 7. personnel development. At this time, review of data bases and resource units has included:

- o ERIC Clearinghouse on Exceptional Children, NISCEM,
- o CEC Data Base on Exceptional Children,
- o CEC Training Institutes,
- o Bibliographies including:
Video Program Guide, 1977-1978

Department of Human Resources, Bureau for Health Services

National Catalog of Films in Special Education

Agency for Instructional Television

Learning Concepts

- o Newsletters
- o Producers
- o Distributors
- o Publishing Houses
- o Associations
- o Universities

These resources have identified media and print items appropriate for further evaluation. Particular items have initially been included if the developer indicated a similar target audience, and the content of the material applied to one of the previously identified content areas. This task must be fully conducted and a greater number of materials identified so that a total analysis of available materials can be made with gaps identified. A Sample of an Initial Technical Assistance Resource Identification can be viewed in Table 7.

Following the identification of specific content materials, evaluation of each identified item must occur to insure quality and appropriateness to target groups. Evaluation will include the review of each item and will include at least the following considerations:

Content

- o Relevance to specific target group: 1. administrators; 2. special and regular teachers; 3. support services personnel.
- o Addresses content area: 1. planning and policy development;

SPECIAL EDUCATION SATELLITE PROJECT MATERIALS ANALYSIS FORM			
PUB. DATE	COST \$375.00, Rental \$32.00	CODE	PRIMARY MEDIUM
TITLE Specific Learning Disabilities: Remedial Programming			AUDIO TAPE
AUTHOR Consultation and Narration by Rita D. Schreiber			AUDIO CASSETTE
PUBLICATION TYPE 16 mm color/sound film			PHONO RECORDS
			FILM STRIP / TAPE
			SLIDE TAPE
			VIDEO TAPE
TIME REQUIREMENT 31 minutes			TAPE SIZE
TARGET AUDIENCE Teachers, administration, parents, psychologists			VIDEO CASSETTE
AVAILABILITY Davidson Films, Inc. 165 Tunstead Avenue San Anselmo, California 94960		SOURCE OF DESCRIPTION Davidson Films brochure	16 MM FILM X
			8 MM FILM
			FILM STRIP
			SLIDE
			PHOTO
			GRAPHIC
DESCRIPTORS Evaluation, Learning Disabilities, Learning Disabled			TRANSPARENCY
			PRINT
			CAI
			CFI
ABSTRACT Follows two L.D. children through evaluative procedures, including neurological and psychiatric information.			RETRIEVAL SYSTEM
			DATA
			OTHER
POTENTIAL APPLICATIONS Classroom teachers, workshops and inservices, parent meetings, psychologists and social workers workshops.			MEDIUM COLOR
			COLOR X
			B/W

Table 7: SAMPLE INITIAL TECHNICAL ASSISTANCE RESOURCE IDENTIFICATION

2. procedural development; 3. child identification; 4. IEP development; 5. educational placement; 6. management and evaluation; 7. personnel development.

- o Designed to convey specific: 1. awareness; 2. knowledge, or 3. skills.
- o Measurement of how well media accomplishes the task it sets out to do: how well, for example, it teaches specific skills in developing the IEP to regular teachers.

Format

- o Effectiveness of presentation (overall aesthetic qualities.)
- o Technical quality of media.
- o General media appropriateness for a mode of conveying the message.

2.2 Acquire existing appropriate media/materials. Following the identification and evaluation of materials for use in providing TA to LEAs, the items which are determined most appropriate through evaluation will be borrowed, rented, leased or purchased (in that order of priority) for use in the production of programs or in providing other TA resources.

2.3 Develop additionally needed media materials. Where gaps have been identified in meeting specific LEA content needs or in absence of a material in an appropriate media, materials will be developed by the staff.

2.4 Identify and contract for necessary resource personnel. Where necessary, outside resource personnel serving as consultants will be brought in to assist in the development of needed materials. For example, an expert in child evaluation

may serve in a panel discussion taped as part of an inservice broadcast to several LEAs or a parent with an exceptional child who has had experience and sensitivity to the issues involved in due process may be asked to share his/her experiences with school personnel via an audiotape recording or videotape (depending which is more appropriate to the audience or outcome desired). Allowance has been made for 40 days of consultant time, shared between production of materials and actual delivery of TA. All consultants will be under contract as necessary.

2.5 Continued identification, acquisition and development of needed media/materials. The process of identification, acquisition and development of appropriate media/materials will continue throughout the TA program.

3. Delivery of technical assistance to pilot LEAs and refine delivery process based on evaluation.

Technical assistance per the TA agreement will be delivered to each of the 20 pilot LEAs. The following are a series of possible technical assistance inservice training programs aimed at the three target sectors. They could effectively be delivered via satellite and implementation would be planned and scheduled on that basis. At this point, the samples included (Table 8) are suppositions, i.e., projected training need areas based on our own knowledge and research of the local districts and their action and implementation efforts of P.L. 94-142. When the actual Special Education Satellite Project gets underway and the formal analysis of the State Program Plans and the local needs assessments are conducted, the actual telecast series for each target group will be developed.

SAMPLE INSERVICE TELECAST	Content Area Related to P.L. 94-142	T A R G E T A U D I E N C E	
		(Primary target audience is indicated by "1"; Relevance for others is indicated by "*")	
		Teachers/Spt.Staff	Admin/School Bd.
<i>Aimed at All Local Participants</i>			
* <u>Overview: Moving from More Restrictive to Less Restrictive Environments</u> (1½ hrs.)	Overview of P.L. 94-142 in implementing "least restriction."	1	1
<i>Aimed at Teachers</i>			
* <u>Personal/Professional Communication Skills for IEP Development</u> (two, 1-hr. telecasts)	IEP Development	1	*
* <u>Developing IEP's Introduction to Theory and Practice</u> (two, 1-hr. telecasts)	IEP Development	1	*
<i>Aimed at Teachers and Support Services Personnel</i>			
* <u>Identifying Exceptional Children in the LEA Administrators</u> (two, 1-hr. telecasts)	Child Evaluation	1	
* <u>Placement of Exceptional Children and the Individualized Education Program (IEP)</u> (two, 1-hr. sessions)	Child Evaluation	1	*
<i>Aimed at Administrators</i>			
* <u>Understanding P.L. 94-142</u> (two, 1-hr. telecasts)	Planning and Policy Development	*	1
* <u>Financing the Mandates: Know Your Financial Resources</u> (two, 1-hr. telecasts)			

Table 8: SAMPLE TECHNICAL ASSISTANCE CONTENT FRAMEWORK

EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
SAMPLE CONTENT OF INSERVICE TRAINING Introductory Telecast Aimed at all Interested Persons in Local School District. <u>*Overview: Moving from More Restrictive to Less Restrictive Environments</u> Participants (teachers, administrators, support service personnel, parents and interested community members) will gain greater understanding and knowledge of P.L. 94-142, recognize the educational implications, understand basic definitions and approaches, and understand the implications of the law. Inservice/Training Telecasts for Teacher and Support Services Personnel. By December of 1979, 18 school districts will have provided 20% of their elementary and secondary teachers and support services personnel with six hours of inservice instruction to assist them in specific areas in the implementation of P.L. 94-142. Such training might include the following topics.	Participants will demonstrate greater understanding of the law through interactive discussions with project staff and on-site coordinator. Teachers attending actively participate in the inservice training telecasts.	Movement will be made towards implementation of P.L. 94-142. Comparison of number of inservice attendees with number of teachers in district.	Participants will work toward implementing strategies. Provision had been made in LEA for teachers to attend training. Telecast is received in at least one school in the district.
<u>*Personal/Professional Communication Skills for IEP Development</u> At the conclusion of the two, one-hour inservice sessions, teachers and other participants will be able to identify and describe variables that may be barriers to effective verbal communication with exceptional children; name and describe specific skills necessary for effective communication; use the communication skills taught at the institute in simulated situations; and develop and describe a strategy for practicing communication skills in their own classrooms.	Teachers will demonstrate greater communication skill development through interaction with site coordinator and successful completion of written/oral follow-up activities.	Self-evaluation and on-site verification of greater skill facility (spot check).	Genuine commitment to increase communication skills in decreasing anxiety and increasing effectiveness in working with handicapped children. Site coordinator will provide adequate, competent follow-up with teachers.

Table 8 Continued

EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
<u>*Developing IEPs: Introduction to Theory and Practice</u> At the conclusion of the two, one-hour inservice sessions, participants (teachers and support services personnel) will have gained an understanding of target behavior, developing specific instructional programs and evaluating their effectiveness. Emphasis will be placed on team approach to developing IEP.	Teachers and other participants will demonstrate greater understanding through interactive questioning of project staff and through group development of IEP.	IEP developed is accurately designed and could be implemented.	Participants are genuinely interested in gaining greater knowledge of identification techniques. Site coordinator will provide adequate and competent follow-up.
<u>*Identifying Exceptional Children in the LEA</u> At the conclusion of the two, one-hour telecasts, support services personnel, teachers, and others in attendance will have gained a greater understanding of the elements in identifying exceptional children in the community and in the classroom. Elements which will be emphasized are: (a) awareness--procedures for developing an on-going public awareness program at the local level; (b) initial identification and location--procedures for carrying out initial identification and location; (c) diagnosis/evaluation--best practices for comprehensively evaluating various kinds of handicapping conditions within various age ranges. By December of 1979, 19 school districts will have provided half their elementary and secondary administrators with four hours of inservice instruction to assist them in implementing the mandates of P.L. 94-142. Such inservice training might include the following topics.	Participants will demonstrate greater understanding of identification techniques through simulated development of identification process with site coordinator in later follow-up session. Administrators in attendance actively participate in inservice training.	Development of accurate identification strategy. Half of districts school administrators and school board members in attendance at inservice sessions.	Follow-up session will be provided for and attended by inservice participants. Genuine commitment on part of administrators and school board members to gain most appropriate public education for exceptional children within their district.

Table 8 Continued

EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
<u>*Understanding P.L. 94-142</u> Principals, school board members and other administrators will gain a greater understanding of P.L. 94-142 and its specific mandates as it relates to their school district - two, one-hour telecasts. <u>*Financing the Mandates: Know Your Financial Resources</u> School administrators and school board members will have the knowledge of how different program alternatives, using combinations of organizational structure and resources, influence the costs of serving children with special needs; critical elements in computing individual program costs of full service; determinance of total funding needs and the proportions contributed by different levels of government; how the mechanisms by which services are funded impact on program effectiveness - two, one-hour telecasts. By December of 1979, 18 school districts will have made available to parents of exceptional and regular children four, one-hour awareness and knowledge development sessions in two areas.	Participants will be able to analyze their own policies and enumerate discrepancies between P.L. 94-142 and their current practices. Participants working as a team will be able to develop a simulated funding strategy utilizing local, State and Federal resources in determining costs, levels of funding and funding formulas.	Review of local policy and mandates of P.L. 94-142 -	Local policy is what is practiced within the district. Funding information available is accurate.

EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
As a result of these two, one-hour sessions, the teachers will: (a) be familiar with current legislation regarding mainstream education; (b) apply mainstream education through a variety of resource settings--specifically they will leave with knowledge of alternatives that have direct application to their specific "how-tos" of mainstream education. These include informal diagnostic techniques, case conferencing, individualized planning and cooperative relationships between specialist and regular class teacher; and (d) know the components of an IEP.	Teachers will demonstrate greater competence through: Demonstrated understanding of P.L. 94-142; knowledge of local school and community resource settings; knowledge of implementation strategies in mainstreaming; interaction with parents; development of simulated IEPs.	Follow-up sessions with written materials and on-site coordinator.	On-site coordinator will provide adequate/competent follow-up.

Table 8 Continued

It is possible that overlap will occur in the relevance of the topic among the three target groups.

3.1 Schedule TA delivery for 20 pilot LEAs in three states. The scheduling of TA for each of the sites will be done to maximize personnel, media format usefulness, cost effectiveness of all factors and smooth coordination of total TA program. The scheduling will take into account individual LEA requirements, on-site delivery constraints, etc. For example, SESP will work to schedule LEA inservice to teachers via satellite during the academic year. Inservice to administrators, usually on an 11 or 12 month contract, is more flexible and might be scheduled during the Summer months. The master schedule, with some built in flexibility, will be posted in the TA program office.

3.2 Deliver academic year TA. Technical assistance will begin to be delivered during the academic year, 1979. The provision of inservice televised instruction delivered via RCA satellite might be limited to those best able to take advantage of it at that time, such as teachers and support personnel. TA in other delivery modes, such as "hot line" assistance, bibliographic sources, research on specific problems, etc., will not be constrained as to season and will begin and continue on an on-going basis to all target groups.

3.3 Deliver Summer TA. Specific inservice training or other appropriate technical assistance for administrators and others on 11 to 12 month contracts will include delivery by RCA satellite or other appropriate means during Summer months. Delivery of services not requiring convening of academic personnel will be made according to agreed upon schedule in an on-going format without regard to Summer/Winter academic calendars.

3.4 Evaluate effectiveness of TA. Evaluation of the effectiveness of TA will be conducted as part of on-going TA responsibilities to:

- o measure progress of LEA in overcoming problems and meeting goals,
- o determine effectiveness of TA: 1. appropriateness of resources and 2. delivery modes as matched with needs,
- o continue to assess needs of LEA: both access progress and identify new areas in need of assistance.

Note: Evaluation of TA component will be fully conducted by the University of Kentucky using the Discrepancy Evaluation Model (DEM) and will be fully discussed in Section D.

3.5 Revise TA procedures. Revision of TA agreements, procedures and methods will be made as a result of LEAs' evaluations. If alternate TA procedures and methods for delivery are identified and determined more effective, the original methods will be modified. If other needs are identified and as goals/needs are addressed through the provision of TA, modification will be made to the TA agreement if determined appropriate by the LEA and SESP.

4. Develop and implement marketing strategies and procedures designed to expand the technical assistance program area on a cost recovery basis.

4.1 Develop marketing strategies. In the development of marketing strategies new clients will be identified and methods for gaining their participation will be developed and implemented. A document, Marketing Strategies I, will be developed and distributed to the SESP staff.

4.2 Develop marketing materials. Materials/media to be used in the implementation of marketing strategies will be developed by SESP TA and marketing staff and will include at least: print materials, audiovisual resources and other materials determined appropriate.

4.3 Implement marketing with existing LEAs. Marketing strategies as developed in 4.2, appropriate for use with current LEAs (20), will be implemented by the SESP staff. All current LEA Superintendents will be recipients of marketing programs as delineated in the Marketing Strategies I report.

4.4 Implement TA marketing with new LEAs. Marketing strategies will be implemented in additional LEAs within the original target states and the six new states. Strategies and materials delineated in Marketing Strategies I will be employed. The emphasis will remain on the SESP providing service to meet specific goals and solve specific problems involved in educating exceptional children and in implementing P.L. 94-142 and Section 504. The new LEAs will be recruited on a cost recovery basis.

4.5 Implement TA marketing with SEAs. Directors of Special Education in six new states will be contacted for participation in the SESP TA program. Marketing strategies will be implemented and these new states will be recruited on a cost recovery basis.

4.6 Implement marketing with other organizations. SESP's TA program will be offered to national educational organizations as assistance to help comply with P.L. 94-142 and Sections 504 utilizing the procedures set forth in Marketing Strategies I. These organizations will be recruited on a cost recovery basis.

5. Provide technical assistance to specified recipients during SESP's second year. The technical assistance portion of the SESP will expand operation to a total of 40 LEAs and six states and associations. New clients will assume a share of the cost.

5.1 Conduct second year TA needs assessments. During the second year, the TA staff will conduct the needs assessments, achieve TA agreements and identify, acquire, and develop appropriate media/materials/resource personnel as necessary to serve new and continuing recipients. These tasks will be conducted with the new and continuing LEAs, new SEAs and national educational organizations to provide specific technical assistance in accordance with procedures and services delineated in Objectives 1 through 2.5.

5.2 Deliver second year TA to 40 LEAs in six states, six SEAs and four national organizations. During the second and subsequent years, TA will be delivered in accordance to TA agreements and delivery schedules developed in a manner similar to those delineated in Objective 3.

5.3 Continue second year marketing activities. Marketing strategies for Year 3 will be developed during the second year of operation and incorporated into Marketing Strategies II. Strategies will include procedures for all new agencies

to assume a greater portion of the costs and for the LEAs served during the first project year to begin cost sharing.

This concludes the discussion of the technical assistance program area. Further amplifying the objectives, expected results, events and scheduling are: 1) the Project Framework, 2) the PERT chart and 3) the Computer-Generated Schedule for the technical assistance area.

GOAL: To deliver specific technical assistance (TA), including inservice training, to local education agencies and communities in appropriately educating all exceptional children and in the implementation of P.L. 94-142 and Section 504 mandates via satellite as well as other telecommunications and non-telecommunications delivery systems.			
OBJECTIVE #: 1. To complete needs assessment in each of the pilot LEAs and achieve a technical assistance (TA) agreement regarding the services to be provided to the LEAs by SESP.			
EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
1.1 To develop the TA procedures needs assessment instruments and "site package."	1.1 100% of TA staff will receive copies of TA procedures, assessment instruments, and "site package."	1.1 Individual query	
1.2 To train TA staff regarding TA procedures and to conduct needs assessments in the pilot LEAs.	1.2 100% of TA staff will prepare a satisfactory "mock" TA agreement.	1.2 TA staff will each participate in a needs assessment/TA agreement development role playing exercise with TA program consultant.	1.2 Competent needs assessment/TA agreement development consultant is available.
1.3 To pilot test the ability of TA staff to satisfactorily conduct an on-site LEA needs assessment and develop a tentative TA agreement.	1.3 100% of TA staff will conduct a needs assessment and develop a satisfactory TA agreement in one "test LEA" each.	1.3 Letter of evaluation from "test LEA" superintendent	1.3 "Test LEAs" can be identified from among LEAs in D.C. metropolitan area and they will agree to participate

TECHNICAL ASSISTANCE (CONT'D.)

EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
1.4 To schedule 20 LEA site visits	1.4 100% of LEAs will each confirm their commitment to and availability for a two-day site visit.	1.4 Letters of confirmation from LEA superintendent	
1.5 To provide each pilot LEA superintendent with a copy of the "site package" of advance preparatory materials.	1.5 100% of pilot LEA superintendents will each acknowledge receipt of the "site package."	1.5 Telephone confirmation	
1.6 To conduct TA needs assessment site visit in each pilot LEA.	1.6 A tentative TA agreement will be developed for 100% of the pilot LEAs.	1.6 Tentative TA agreement on file in project office	
1.7 To develop a tentative TA agreement with each pilot LEA.	1.7 100% of pilot LEA superintendents will each sign-off on tentative TA agreement.	1.7 Written acknowledgement by superintendent	
1.8 To analyze and ratify TA agreements.	1.8 A final plan for delivery of TA to the individual and collective LEAs will be developed and the individual TA agreements will be accepted by 100% of pilot LEA superintendents.	1.8 Final plan and TA agreements bearing signatures of LEA superintendents on file in project office	

TECHNICAL ASSISTANCE (CONT'd.)

PROJECT FRAMEWORK: SPECIAL EDUCATION SATELLITE PROJECT

GOAL: To deliver specific technical assistance (TA), including inservice training, to local education agencies and communities in appropriately educating all exceptional children and in the implementation of P.L. 94-142 and Section 504 mandates via satellite as well as other telecommunications and non-telecommunications delivery systems.

OBJECTIVE #: 2. To acquire existing or develop new media/materials and identify resource personnel necessary for fulfilling technical assistance agreements in the pilot LEAs.

EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
2.1 To identify existing appropriate media/materials.	2.1 SESP Materials Analysis Forms will be completed for 100% of appropriate and currently available media/materials.	2.1 Examination of Materials Analysis Form file	
2.2 To acquire existing appropriate media/materials.	2.2 100% of appropriate and currently available media/materials will be borrowed, rented, leased, or purchased as necessary.	2.2 Examination of SESP media/material inventory	
2.3 To develop/produce additionally needed media/materials.	2.3 100% of SESP developed/produced media/materials will have been added to the SESP media/materials inventory.	2.3 Examination of SESP media/materials inventory	
2.4 To identify and contract for necessary resource personnel.	2.4 100% of resource personnel necessary for fulfilling the TA agreements will provide a commitment to do so.	2.4 Letters of commitment	
2.5 To continue identification, acquisition, and development of needed media/materials.	2.5 See 2.1, 2.2, 2.3	2.5 See 2.1, 2.2, 2.3	

TECHNICAL ASSISTANCE (CONT'D.)

PROJECT FRAMEWORK: SPECIAL EDUCATION SATELLITE PROJECT

GOAL: To deliver specific technical assistance (TA), including inservice training, to local education agencies and communities in appropriately educating all exceptional children and in the implementation of P.L. 94-142 and Section 504 mandates via satellite as well as other telecommunications and non-telecommunications delivery systems.			
OBJECTIVE #: 3. To deliver technical assistance to pilot LEAs and refine delivery process based upon evaluation.			
EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
3.1 To schedule TA delivery for 20 pilot LEAs in three pilot states.	3.1 100% of LEA superintendents will be provided with the TA delivery schedule and approve it.	3.1 Letters on file from superintendents acknowledging receipt and approval	
3.2 To deliver TA services scheduled for the remainder of the 1978-79 academic year.	3.2 Each of 20 pilot LEAs will receive 12 hours of TA via satellite and all other TA as scheduled during the period 4/1-6/30, 1979.	3.2 TA delivery log	3.2 Delivery modes will function reliably
3.3 To deliver TA services scheduled for the summer following the 1978-79 academic year.	3.3 Each of 20 pilot LEAs will receive 12 hours of TA via satellite and all other TA as scheduled during the period 7/1-9/30, 1979.	3.3 TA delivery log	3.3 There will be no power interruptions
3.4 To evaluate the effectiveness of the TA delivered during the 1st project year.	3.4 80% of pilot LEA superintendents will indicate to the evaluator that TA delivered met their needs and expectations as specified in their TA agreement.	3.4 Evaluation report	

TECHNICAL ASSISTANCE (CONT'D.)

EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
3.5 To revise TA procedures based upon evaluation results.	3.5 100% of TA staff will receive copies of revised TA procedures.	3.5 Individual query	

TECHNICAL ASSISTANCE (CONT'D.)

PROJECT FRAMEWORK: SPECIAL EDUCATION SATELLITE PROJECT

GOAL: To deliver specific technical assistance (TA), including inservice training, to local education agencies and communities in appropriately educating all exceptional children and in the implementation of P.L. 94-142 and Section 504 mandates via satellite as well as other telecommunications and non-telecommunications delivery systems.

OBJECTIVE #: 4. To develop and implement marketing strategies and procedures designed to expand the technical assistance program area on a cost-recovery basis.

EXPECTED RESULTS:

4.1 To develop TA marketing strategies and procedures.

4.2 To develop TA marketing materials.

4.3 To implement TA marketing procedures with 20 pilot LEAs in three pilot states.

4.4 To implement TA marketing procedures with 50 new LEAs from the three pilot states plus from an additional six states.

VERIFIABLE INDICATORS

4.1 TA Marketing Strategies Report I will be received by 100% of SESP staff.

4.2 Sample TA marketing materials (newsreleases, media packages, newsletters, brochures, etc.) will be received by 100% of SESP staff.

4.3 100% of pilot LEA superintendents will receive marketing materials in accordance with provisions set forth in TA Marketing Strategies Report I (also see below).

4.4 Forty LEA superintendents from six states (including three pilot states) will indicate a commitment to receiving SESP TA during the project's second year. (New LEAs reflecting provision of TA on cost-recovery basis.)

MEANS OF VERIFICATION

4.1 Individual query

4.2 Individual query

4.3 Telephone confirmation

4.4 Letter of commitment from superintendents

ASSUMPTIONS

TECHNICAL ASSISTANCE (CONT'D.)

EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
4.5 To implement TA marketing procedures with nine SEAs.	4.5 Six SEA Directors of Special Education will indicate a commitment to receiving SESP TA on a cost-recovery basis during the project's second year.	4.5 Letter of commitment from SEA Director of Special Education	
4.6 To implement TA marketing procedures with national educational organizations.	4.6 Four national educational organizations will indicate a commitment to receiving SESP TA on a cost-recovery basis during the project's second year.	4.6 Letter of commitment for organization's Executive Director	

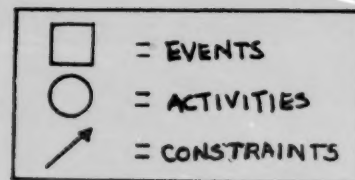
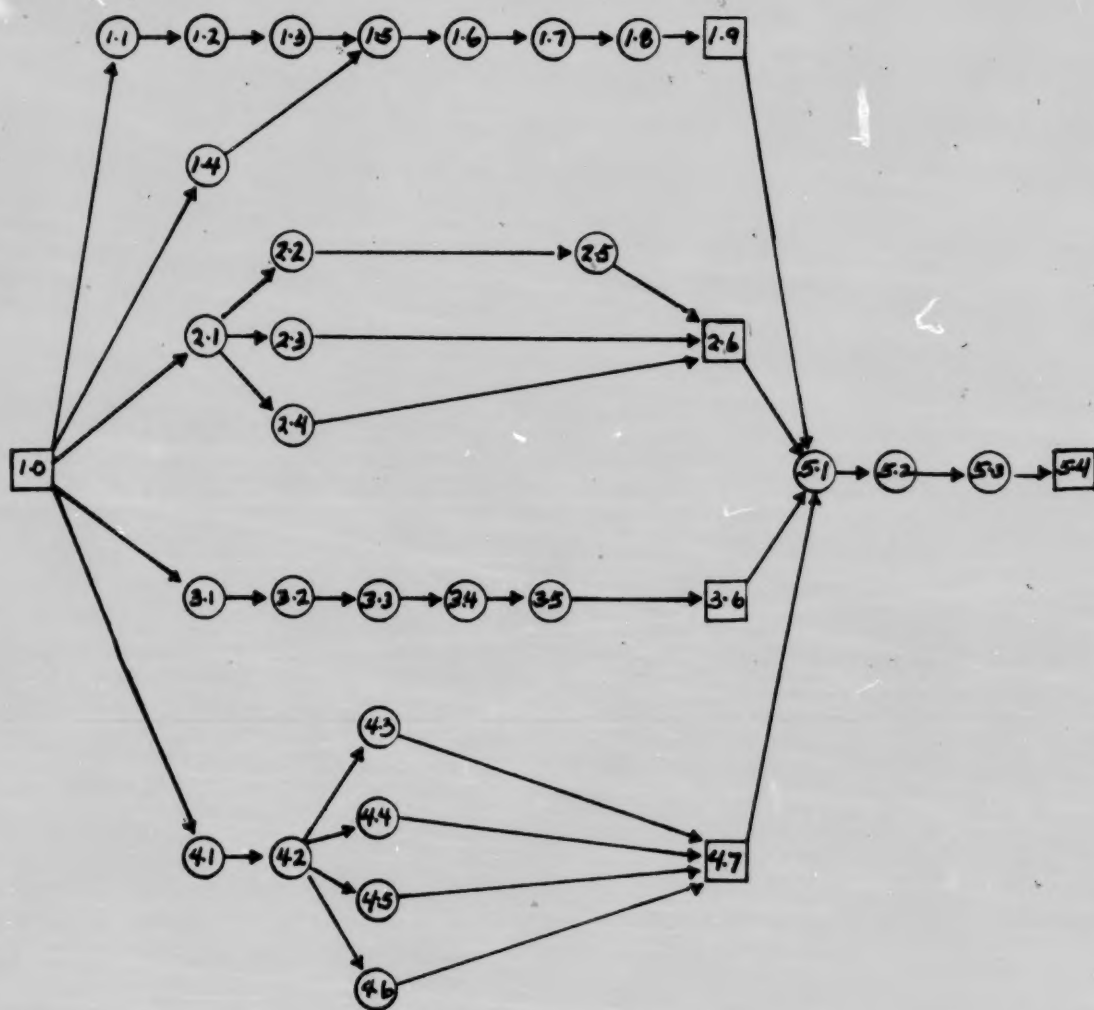
TECHNICAL ASSISTANCE (CONT'D)

PROJECT FRAMEWORK: SPECIAL EDUCATION SATELLITE PROJECT

GOAL: To deliver specific technical assistance (TA) including inservice training, to local education agencies and communities in appropriately educating all exceptional children and in the implementation of P.L. 94-142 and Section 504 mandates via satellite as well as other telecommunications and non-telecommunications delivery systems.			
OBJECTIVE #: 5. To provide technical assistance to specified recipients during the project's second year.			
EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
5.1 To conduct needs assessments, achieve TA agreements; and identify, acquire, develop appropriate media/materials/resource personnel as necessary to serve recipients identified as a result of activities 4.3 - 4.6. 5.2 To deliver TA in accordance with year two TA agreements and delivery schedule.	5.1 See verifiable indicators 1.4 through 2.5. 5.2 100% of LEA superintendents, SEA directors, and organization executives will be provided with the TA delivery schedule and approve it. 5.2.1 Each of 40 LEAs will receive 48 hours of TA via satellite and all other TA as scheduled during the period 10/1/79 - 9/30/80. 5.2.2 Each of six SEAs will receive six hours of TA via satellite and other TA as scheduled during the period 10/1/79 through 9/30/80	5.1 See means of verification 1.4 through 2.5 5.2 Letters on file acknowledging receipt and approval. 5.2.1 TA delivery log 5.2.2 TA delivery log	

TECHNICAL ASSISTANCE (CONT'D.)

EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
5.3 To continue second year TA marketing activities	5.2.3 Each of four national educational organizations will receive three hours of TA via satellite and other TA as scheduled during the period 10/1/79 through 9/30/80. 5.3 TA Marketing Strategies Reporting II will be received by 100% of SESP staff.	5.2.3 TA delivery log 5.3 Individual query	



SPECIAL EDUCATION
SATELLITE PROJECT

COUNCIL FOR
EXCEPTIONAL CHILDREN

TECHNICAL ASSISTANCE DEVELOPMENT
SUMMARY ACTIVITY / EVENT NETWORK

PROJECT
DIRECTOR

R. WELCH

FIG. 3

NETWORK
DEVELOPER

E. BLACKHURST

3 MAR 78

2. DIRECT SERVICES

TO GIFTED AND TALENTED STUDENTS

This program area contains the following parts:

- o Work Breakdown Structure of Direct Services to Gifted and Talented Program Area*
- o Narrative of Direct Services to Gifted and Talented Program Area*
- o Project Framework: Direct Services to Gifted and Talented Program Area*
- o PERT Chart: Gifted/Talented Activity and Event Network*
- o Schedule for Project "Gift/Tal" - computer-generated table*

WORK BREAKDOWN STRUCTURE DIRECT SERVICES TO GIFTED AND TALENTED PROGRAM AREA

EVENTS	ACTIVITIES
1.0 Start Mentor Program	1.1 Recruit and select staff 1.2 Develop student participant and school selection procedures 1.3 Provide pilot LEAs with information regarding potential participation in the program 1.4 Conduct initial screening of students 1.5 Assess student interests 1.6 Select 16 students
1.7 Gifted Children Selected	2.1 Develop mentor training package 2.2 Identify potential mentors 2.3 Match mentors with students interests 2.4 Select mentors 2.5 Train mentors
2.6 Mentors Selected	3.1 Identify available and install additionally needed equipment in 8 participating LEA's. 3.2 Develop procedures for operation of equipment 3.3 Obtain computer conferencing contract 3.4 De-bug system operation 3.5 Develop seminar system procedures manual 3.6 Develop notepad system procedures manual 3.7 Develop encounter system procedures manual 3.8 Train selected students
3.9 Mentor Telecommunications Delivery System Operationalized	4.1 Conduct pre-video teleconference activities 4.2 Conduct video teleconference 4.3 Implement and operate seminar series 4.4 Implement and operate encounter series 4.5 Implement and operate notepad system 4.6 Evaluate mentor program 4.7 Revise program as necessary
4.8 Mentor Program Implemented	5.1 Identify 10 new LEA's 5.2 Screen students 5.3 Identify student interests 5.4 Select 40 new students 5.5 Identify 10 new mentors 5.6 Train new mentors 5.7 Operationalize second year program
5.8 Second Year Mentor Program Implemented	

DIRECT SERVICES TO GIFTED AND TALENTED STUDENTS
PROGRAM AREA

The Direct Services to Gifted and Talented Students Program area of the Special Education Satellite Project (SESP) contains the following objective:

To establish a mentor program during FY 1979 for 16 gifted/ talented students in four content areas in four to six sites with four mentors using a computer conferencing system, augmented by other telecommunications modalities.

To achieve this objective, a series of activities will be developed and implemented. The activities will include identifying gifted and talented students, assessing their interests, selecting students who share interests, and selecting mentors. The students and mentors will be trained in their roles and in the teleconference techniques. The coordinator will monitor the process and aid in the process whenever necessary.

A mentor program will provide the direct services desired for gifted and talented students. A mentor will be an adult selected because of his/her high level of accomplishment in a discipline of interest to identified gifted and talented students. The students will have been identified by their teachers through a process developed by the gifted program coordinator. One mentor will work with two to four students who are interested in the mentor's accomplishments and ideas. Initially, a video teleconference will introduce the participants in each of the four mentor groups to be developed in the first year. Following this initial video teleconference, computer conferencing will be the basic telecommunications system and can take several forms. The most probable will be the following forms developed by the Institute for the Future.

- 1) The Encounter - This is a form designed to allow for topic discussion among several persons by way of a computer. The two to four persons who are interacting in each mentor group will be typing the message they wish to convey. In this plan, the mentor will play the role of the leader and facilitator and will, therefore, encourage all to participate in discussions and ask questions. The mentor can combine the discussion with short sections of lecture to clarify points. The interaction between mentors and students could start with the "Encounter". Through this technique, a mentor could assess the needs, background and interests of each student in the study area.
- 2) The Seminar - After the "get acquainted" activities of the first "Encounter" interaction, a mentor may wish to deliver a report or lecture to the students to give them basic information, provide them with a bibliography for study, or list possible activities for the students to do. As the mentor presents his information he/she may make it possible for the students to ask questions asynchronously. The questions could then be asked and answered in a "Notepad" type of interaction.
- 3) The Notepad - This interaction allows both mentor and students to send and respond to messages at times most suitable to individual schedules. This feature is especially valuable to the mentor who, as an adult, must keep to a work schedule. The messages can be sent to an individual in the group. This will enable a mentor to answer a question from individual students, will enable a mentor to send a reinforcing and/or a motivating message to an individual student, and will also enable the mentor to send a message which all students will receive. It also enables students to ask the mentor individual questions between seminar and discussion sessions, and enable students to communicate with each other.

The design of the mentor program allows for some video teleconferencing and audio conferencing. The first interaction will be a video conference which will allow for the need for seeing persons who will be developing a close relationship. The time for additional video interaction will be based on the request of each mentor group. To increase the feeling of close personal contacts, arrangements will be made for audio conferencing among the members of each mentor group at selected intervals. The combination of video and audio conferencing should eliminate the possible feeling of alienation arising from dependence on a "machine". The video links will help stabilize the relationship between mentor and students. According to Young, telecommunication conferencing is sufficient to develop an understanding of concepts. Computer conferencing adds the printed mode which will increase this possibility; video conferencing substitutes for face-to-face interaction which will increase the participants' confidence and perception of understanding.

In addition to these teleconferencing modes, the mentor may request that papers be written or designs be made which can be sent by mail. This will be one of the many options offered to each group, but will not be the major means of communication.

The Role of the Mentor

The mentor role will be developed to suit the needs of each mentor and respective group of students. A mentor should first be an advocate of a way of life and, secondly, be a model, a vision of what a student can become. To be successful, a mentor must have a sense of timing and a willingness to plan guided experiences.

The guided experiences will develop from the on-going assessment by the mentor. It should include immediate interpretation of experiences and structuring of a "creative process", both essential elements of the mentor process if it is to be successful in developing a creative and productive way of thinking and living. A successful mentor will have an equal interest in his/her vocation and in young people. A mentor should develop the sense of "being a mentor", a role which requires a desire to better the world by working with the young and a posture reflecting the "self-actualized" person as described by Maslow.

The mentor will provide the catalyst and model for investigation of the specified common interest of the students in the mentor group. The mentor can require an appropriate level of active investigation between the telecommunications with the students. During the second and subsequent years, ten mentor groups will be participating in the program. This will involve 10 mentors and 20 to 40 students.

Criteria and Process for Selecting Mentors

The criteria for selecting mentors for gifted students are the following:

- 1) A person who has demonstrated an unusually high level of accomplishment in a particular area of interest or vocation.
- 2) A person who has respect for young people and the desire and ability to work with them.
- 3) A person who is willing to use a variety of forms of telecommunications.
- 4) A person who has the time and desire to plan appropriate sequences of learning activities conducive to the proposed telecommunications.
- 5) A person who is willing to follow the lead of the gifted student when appropriate to do so.

In addition to these traits, there will be a concerted effort by project staff to locate mentors who have a sense of genuineness, a sense of empathic understanding, a feeling of caring for students and a sense of trust in young people, all traits suggested as essential for effective teachers.

For the first year of operation, mentors will be selected by means of consultation with gifted and talented student educators. During the first and subsequent year of operation, students identified as gifted or talented will be given an interest inventory. Prospective mentors will be contacted on the basis of an analysis of these inventories and the recommendation of persons both in respect to their expertise and in respect to their interest in young people.

The Role of the Student

The student role will be two-fold. In relation to the mentor, the student will be asked to adopt the role of an apprentice. A special relationship will also be developed among the two to four students assigned to one mentor. The apprentice role will include an awareness of the accomplishments of the mentor, provided in the introductory materials. The students will also be trained in creative thinking and questioning techniques so they will be creative and effective questioners. The apprentice role will also include a commitment to learning and responding to requests from the mentor. A student who tires of the program and no longer wishes to continue in this role will be allowed to drop from the program.

Criteria and Process for Selecting Students

Teachers will be trained by project staff to observe students prior to selection to detect giftedness, recognize talent and creativity. There will be a concerted effort to find gifted handicapped and gifted minority students. Observational criteria will be:

- 1) Habitually checks multiple sources for information.
- 2) Shows unusual ability to organize complex tasks.
- 3) Demonstrates prolonged attention when working on independent investigation.
- 4) Works beyond designated times or undertakes self-assigned homework.
- 5) Pursues self-initiated learning to a greater depth than do his peers.
- 6) Displays evidence of curiosity and attempts experimentation.
- 7) Is an absorbed listener in discussions and challenges peers or adults.
- 8) Raises penetrating questions beyond "know how".
- 9) Challenges, compares and perceives contradictions in ideas of authorities.
- 10) Is not satisfied with single cognitive performances such as accumulation of knowledge or memorization of data.
- 11) Prefers to learn by creative and independent ways rather than by authority.
- 12) Exhibits freedom of expression in oral discussion and story telling.
- 13) Produces ideas for solving problems.

Rationale of Methodology

Mentor programs for gifted and talented are a promising practice being developed in many parts of the country. The limitation of such programs is the necessity of finding appropriate mentors within close proximity of the students. A telecommunications system that enables students and mentors to develop a close relationship over long distances would be of great benefit to students who may never have a parallel opportunity. The communications system chosen for interaction among a group of two to four students and a mentor is computer conferencing augmented by video and audio teleconferencing. There has been considerable research done on the effectiveness of computer conferencing. Three of the styles or systems of computer conferencing which were developed by the Institute for the Future (Vallee) will be used. They provide for various modes of interaction which will be necessary for a mentor to lead students into developing skills and attitudes toward research in an area of interest. The seminar style allows for information dissemination; the encounter allows for discussion among the participants at prearranged times; and the note-pad style allows for intermittent and non-arranged communication. Two-way video teleconferences will enable the participants to have face-to-

- 14) Organizes classmates for productive solutions to problems.
- 15) Produces artistic renditions in art, music, drama and literature.
- 16) Exhibits an unusual sense of humor.

These observed behaviors will be combined with achievement in school subjects, standardized test scores, and student interest in a mentor program to form a composite picture of each suggested student.

During the first year the participants will be limited to those students whose interests coincide with the interest areas to be developed during that year. As interest areas are developed in future years of the project, students whose talents are in these areas will be encouraged to participate. A student who retains an interest in continuing beyond the first year of participation will be allowed to do so if the mentor is willing.

The selection process for student participation will be initiated by training teachers to make observations based on the above criteria. The following steps will then be taken: an interest inventory will be given to the identified students; an analysis will be made and interest areas identified; mentors will be selected to match the identified interest areas.

face interaction which is expected to provide a feeling of confidence and rapport among the participants. As needed, audio conferencing will also be arranged.

The mentor groups will consist of a mentor and two to four students. Each participant in a group may be at considerable distance from any one of the other participants. Including several students rather than one to interact with a mentor is preferred. Students can develop a feeling of support for one another and confidence that others of his/her own generation are also interested in ideas far beyond that of their local peers. As the students participate in investigative activities, their participation in the note-pad and encounter communication can increase the development of skills, interest and understanding of the concepts being pursued. Peer support is an important ingredient in the development of adolescents.

Each mentor group will be organized around a general or specific interest. During the first few teleconferences, the interest area will be more specifically defined around the emerging questions of the students. If the original interest area is broad, the mentor may wish to introduce information and research ideas that will help the group focus in on a specific topic.

One possible mentor group interest is in the general area of physics. From the range of questions from the students, the mentor might suggest focusing in on the study of laser beams. This is a topic that has attracted the attention of many

adolescents because of the recent development of the phenomena and consequent publication of its perspective applications. The gifted and talented students can easily be guided into an understanding of the physical characteristics and properties and can be led to hypothesize future applications of the device.

Another possible area of interest for a mentor group would be creative mathematics. Gifted and talented students can be taught to express natural phenomena in mathematical terms, develop their own theorems and propositions for geometrical configurations.

Mentor groups will also be developed in the humanities. A skillful mentor can provide a model and direction for budding writers. Most students have never had contact with a published writer. The continuous contact with a writer would open up horizons that might be completely absent for many students. In future years of the project, visual and performing arts will be possible as interests through the increased use of two-way video telecommunications develop. Students to whom famous paintings are outside of possible viewing can be in the position to see and be taught to appreciate the skills of the great artists. Their own skill development can be guided by superior art teachers who would be completely out of their reach without the video communication made possible in the project.

1. Start mentor program area.

1.1 Recruit and select staff. The staff for this program area will consist of a program coordinator and a secretary. During the first year of operation these staff members will work on a one-half time basis. The coordinator has these responsibilities: 1. train teachers to select gifted and talented students; 2. assess selected student's interests; 3. develop the mentor pool; 4. train the mentors in the mentor role; 5. train the students to participate in computer conferencing techniques; 6. where necessary,

train the mentors in computer conferencing techniques; 7. match mentors and students; 8. arrange for equipment and conference times; 9. monitor the system; and, 10. take steps to develop the program for the ensuing years.

1.2 Develop student participation and school district selection procedures.

The school districts will be selected to coordinate with the other project activities. The coordinator will develop a rationale for selecting districts for the first year of project operation. Planning for future years will absorb the districts who are in on the initial program.

1.3 Provide pilot LEAs with information regarding potential participation in the program. The prospective LEAs will be contacted with an explanation of the responsibilities of the staff if they participate in the program. Some LEAs who were initially selected may wish to postpone their participation until the following year. Since there will only be four districts participating in the first years, these preferences can be honored.

1.4 Conduct initial screening of students. After the districts and the school within each district has been identified, teachers will be asked to volunteer to participate in the program. The training for student selection as gifted or talented will take place immediately and a general pool of students will be identified to participate in the program.

1.5 Assess student interest. The selected students will be given an interest inventory to complete. On the basis of the inventory, general areas of interest will be identified. The students whose interests coincide will be grouped.

1.6 Select 16 students. The students who have selected interest areas that match potential mentors will be those to be in the first run of the program. The 16 students to be in the first year of the program will be grouped by interest. Each group

will consist of three to five students. The students will probably be in different districts and different parts of the country.

2. Selection of Mentors.

2.1 Develop mentor training package. The coordinator will develop a mentor training package which will primarily be self-instructional. The basic premises of a mentor-student will be explained. Some background in the characteristics and personalities of many gifted and talented students will be related. Suggestions for successful computer conferencing will also be part of the package. Although the package will be self-instructional, provisions for question and discussion with the coordinator will be made.

2.2 Identify potential mentors. During the development of all of the previous activities, the coordinator will also be contacting potential mentors for the first year's run as well as for future years. Mentors who have been highly successful in their fields, who are interested in young students, who feel comfortable with computer conferencing, and who have the time and interest will be asked to be part of the pool.

2.3 Match mentors with students' interests. The match of mentor with students will be completed from the analysis of the interest inventory data and data from the mentors. An effort will be made to match students and mentors who are not within close proximity so that the telecommunications aspect of the project can be demonstrated.

2.4 Select mentors. The final selection of mentors for the initial year will depend on the accuracy of mentor-student match and the willingness of the mentor to

commit her/himself to the time and effort with a minimum of consulting expense requested.

2.5 Train mentors. The mentors will be given the training package previously developed by the coordinator. The coordinator will keep in close touch with each mentor to resolve any problem or question that might arise.

3. Installation of mentor delivery system.

3.1 Identify available and install additionally needed equipment in eight participating LEAs. The computer terminals to be used will be identified during the first weeks after the mentor-student selection. The issue of computer compatibility will be resolved during this time.

3.2 Develop procedures for equipment use. Procedures for equipment use will include guidelines for time sharing with others in the school or district who are in the project. Skills needed to use the equipment will be identified and described in a manual.

3.3 Obtain computer conferencing contracts. Contracts for computer use in conferencing techniques will be obtained from the computer leasing company.

3.4 De-bug system operation. The coordinator will use the system for clarifying roles and answering questions. During this sequence of communication, problems inherent in the system will be solved so the operation will be smooth for the mentors and students.

3.5 Develop seminar system manual. A manual will be developed to help the mentors and students communicate in a seminar style of computer conferencing. Suggestions for ground rules in the exchange which will be helpful to mentors and students in establishing their expectations for this type of exchange will be written into the manual.

3.6 Develop note-pad system manual. The note-pad system in computer conferencing allows for communication between a mentor and individual students and between students. The flexibility of time commitment and possibility for development of rapport between individuals in the group will be described in a manual.

3.7 Develop encounter system manual. The encounter type of computer conferencing resembles a discussion format in a classroom. Ground rules for exchange and interruption for questions during information giving will be suggested in a manual.

3.8 Train selected students. The students who have been selected for participation will be trained, using the self-instructional manual developed in the previous activities. The coordinator will monitor this activity very closely to encourage the students and alleviate possible misunderstandings.

4. Implement mentor program.

4.1 Conduct pre-video teleconference activities. In addition to the initial training activities, the students will receive materials relative to the background of their mentor. This might include interests, accomplishments and some hypotheses the mentor wants to research. Each member of the groups will also receive a preview of the procedures that will take place during the video teleconference.

4.2 Conduct video teleconference. The mentor and students will meet one another in a one-way video, two-way audio teleconference. The students will see their mentor for the first time. Pictures of the students will be displayed when they are talking. The mentor will develop his/her own sequence of discussion. Since the mentor group has been developed around a general interest area, the mentor will probably question the students as to specific directions they wish to take. Plans

for subsequent computer conferencing will be discussed. An additional video conference will be arranged at a later date upon request of the mentor.

4.3 Implement and operate seminar series. The seminar series will enable the mentor to express basic information he/she wants the students to have. The seminar allows for some two-way conversation which allows students to ask questions to clarify concepts. The mentor and students will design these series themselves on the basis of need.

4.4 Implement and operate encounter series. During each of the encounter sessions, the conversations will be free-flowing. The mentor will be the discussion leader, at times taking the role of the teacher and at times leading the discussion into areas of benefit to the students. The scheduling of these sessions will be mutually developed by members within a group. The seminar and encounter sessions will alternate in various patterns in a bi-weekly (every other week) schedule.

4.5 Implement and operate note-pad systems. The note-pad system will be initiated when the mentor and students agree that the system would be beneficial. The mentor will attempt to attend him/herself to the needs of the individual students and may, therefore, initiate private "conversations" with individual students. The students may wish to leave messages to each other. The students may run into problems in the pursuit of the activities planned during the encounter and by use of the note-pad, can get the help they need. The messages may be sent to a specified person at any-time. Private messages can be sent to one person or group messages can be sent.

4.6 Evaluate mentor program. The coordinator will implement the evaluation procedures developed by the evaluator (University of Kentucky) utilizing the

Discrepancy Evaluation Model (DEM). Each aspect of the program, the student selective process, the mentor selection process, the interest analysis, the assignments note groups, and the various computer conferencing systems, will be evaluated.

4.7 Revise program as necessary. Each aspect of the mentor program will be analyzed and those that merit changes will be revised on the basis of the suggestions given by the participants and the evaluation team.

5. Implement second year mentor program.

5.1 Identify ten new LEAs. During the first year of the project, four mentors and 16 students in four different LEAs participated in the mentor program. During each of the subsequent years, 10 mentor groups will be developed. To develop this number of mentor groups, additional LEAs will be asked to participate. If the original districts wish to continue in their participation, this will be possible. Additional LEAs to increase the number up to 10 will be part of the pool participating in the other activities of the project.

5.2 Screen students. A process similar to the original, depending on the evaluation, will be used to identify gifted and talented students in the 10 LEAs.

5.3 Identify student interests. An interest inventory similar to the inventory used in the first year will be administered to the identified students.

5.4 Select 40 students. The interest inventories will be analyzed as in the first year and students clustered by interests. From this analysis, 40 students will be selected for participation in the mentor program. Sixteen of these may be continuing

their work from the first year if their mentor is willing to continue with them. Students should be able to continue with a mentor for a period of two years if each so desires.

5.5 Identify ten new mentors. Ten mentors will be identified for each year of operation subsequent to the first year. Some of the mentors may want to participate for more than one year. If they have been helpful to the students, this should be possible.

5.6 Train new mentors. Training for the new mentors will be based on the evaluation of the original training activities and the subsequent revision. A computer conference among the experienced mentor and the new mentors will add to the effectiveness of the training.

5.7 Implement second year. The activities in the second and subsequent years will parallel those of the first year, with the changes suggested by evaluation inserted.

Following this discussion of the technical assistance program and further amplifying the objectives, expected results, events and scheduling are: 1) the Project Framework, 2) the PERT Chart, and 3) the Computer-Generated Schedule for the technical assistance area.

GOAL: To provide gifted and talented students with enrichment experiences using a "mentor program" presented via a telecommunications mode.

OBJECTIVE #: 1. To identify and select gifted and talented students from the pilot LEAs to participate in a "mentor program" of educational enrichment.

EXPECTED RESULTS:

- 1.1 To recruit and select a program area staff.
- 1.2 To develop student participation selection procedures.
- 1.3 To provide pilot LEAs with information regarding their potential participation in the program.
- 1.4 To conduct initial screening of potential student participants.

VERIFIABLE INDICATORS

- 1.1 One half-time area coordinator and one half-time secretary will be hired.
- 1.2 The project director and project coordinator will receive a copy of the completed student participation selection procedures.
- 1.3 100% of pilot LEA superintendents will receive an overview of the program and a copy of the student participation selection procedures.
- 1.4 200 potential students from the 20 pilot LEAs will be administered the initial screening instrument.

MEANS OF VERIFICATION

- 1.1 Personnel action forms on file
- 1.2 Individual query
- 1.3 Telephone confirmation of receipt
- 1.4 Completed initial screening instruments will be on file in the project office

ASSUMPTIONS

DIRECT SERVICES TO GIFTED AND TALENTED PROGRAM AREA (CONT'D.)

EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
1.5 To assess potential students' interests. 1.6 To select student participants.	1.5 100 of the potential students from the 20 pilot LEAs will be identified and administered the interest inventory. 1.6 16 student participants (4 students representing each of four different interest areas) will be selected, with two students being selected from each of 8 LEAs.	1.5 Completed interest inventories will be on file in the project office. 1.6 Participant roster will be on file in the project office.	

DIRECT SERVICES TO GIFTED AND TALENTED PROGRAM AREA (CONT'D.)

PROJECT FRAMEWORK: SPECIAL EDUCATION SATELLITE PROJECT

GOAL: To provide gifted and talented students with enrichment experiences using a "mentor program" presented via a telecommunications mode.

OBJECTIVE #: 2. To identify, select, and train mentors for use in providing educational enrichment experiences for gifted and talented students.

EXPECTED RESULTS:

2.1 To develop the mentor training package.

2.2 To identify potential mentors.

2.3 To match mentors with interests of selected students.

2.4 To select mentors for participation in the first year's program.

VERIFIABLE INDICATORS

2.1 The project director and project coordinator will receive a copy of the completed mentor training package.

2.2 Eight potential mentors will be identified

2.3 A matrix of mentor expertise to student participant interest will be prepared.

2.4 Four mentors will be selected and each matched to four student participants.

MEANS OF VERIFICATION

2.1 Individual query

2.2 Resumes' reflecting mentors' area of expertise will be on file in the project office.

2.3 Matrix on file in project office.

2.4 Letters of commitment from participating mentors.

ASSUMPTIONS

DIRECT SERVICES TO GIFTED AND TALENTED PROGRAM AREA (CONT'D.)

EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
2.5 To train mentors in use of telecommunications and educational enrichment procedures.	2.5 Four mentors will each self-administer the mentor training package and prepare learning objectives for each of their respective students.	2.5 Training assessment instruments and lists of student learning objectives will be completed by each mentor and on file in project office.	

DIRECT SERVICES TO GIFTED AND TALENTED PROGRAM AREA (CONT'D.)

PROJECT FRAMEWORK: SPECIAL EDUCATION SATELLITE PROJECT

GOAL: To provide gifted and talented students with enrichment experiences using a "mentor program" presented via a telecommunications mode.

OBJECTIVE #: 3. To operationalize a mentor telecommunications delivery system in the eight pilot LEAs.

EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
3.1 To identify available and install additionally needed equipment.	3.1 Telecommunications equipment necessary for linking the four mentors to each of their four students will be in place.	3.1 Written report from Technical Component Coordinator on file in project office.	
3.2 To develop procedures for operation of telecommunications equipment.	3.2 100% of students and mentors will receive a copy of the Telecommunications Equipment Operation Procedures Manual	3.2 Telephone confirmation	
3.3 To obtain computer teleconferencing contract.	3.3 A contract will be signed by CEC and Infomedia.	3.3 Signed contract on file in project office.	
3.4 To "de-bug" system operation.	3.4 On two pilot tests, the system will operate with no difficulties.	3.4 Test results	
3.5 To develop "seminar system" procedures manual.	3.5 100% of mentors and students will receive a copy of the "Seminar System Procedures Manual."	3.5 Telephone confirmation	

DIRECT SERVICES TO GIFTED AND TALENTED PROGRAM AREA (CONT'D.)

EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
3.6 To develop "note-pad system" procedures manual.	3.6 100% of mentors and students will receive a copy of the "Note-pad System Procedures Manual."	3.6 Telephone confirmation	
3.7 To develop "encounter system" procedures manual.	3.7 100% of mentors and students will receive a copy of the Encounter System Procedures Manual.	3.7 Telephone confirmation	
3.8 To train student participants.	3.8 90% of student participants will score 80% or better on the Teleconferencing Readiness instrument.	3.8 Completed instruments on file in project office.	

DIRECT SERVICES TO GIFTED AND TALENTED PROGRAM AREA (CONT'D.)

PROJECT FRAMEWORK: SPECIAL EDUCATION SATELLITE PROJECT

GOAL: To provide gifted and talented students with enrichment experiences using a "mentor program" presented via a telecommunications mode.

OBJECTIVE #: 4. To implement a series of educational enrichment activities using a mentor program.

EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
4.1 To conduct all pre-video teleconference activities.	4.1 100% of persons responsible for conducting the initial video teleconference will indicate that all preparatory activities have been successfully completed.	4.1 Telephone confirmation	
4.2 To conduct the initial video teleconference.	4.2 Four mentors will each participate in a video teleconference with their respective four students.	4.2 Mentor program delivery log	
4.3 To implement and operate the seminar series.	4.3 Four mentors will each conduct as appropriate a series of "seminar type" activities with their respective four students.	4.3 Mentor program delivery log	
4.4 To implement and operate the encounter series.	4.4 Four mentors will each conduct as appropriate a series of "encounter type" activities with their respective students.	4.4 Mentor program delivery log	
4.5 To implement and operate the note-pad series.	4.5 Four mentors will each conduct as appropriate a series of "note-pad type" activities with each of their four students.	4.5 Mentor program delivery log	

DIRECT SERVICES TO GIFTED AND TALENTED PROGRAM AREA (CONT'D.)

EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
4.6 To evaluate the effectiveness of mentor program activities to date.	4.6 80% of students will have achieved 90% of learning objectives established by their respective mentors.	4.6 Evaluation report	
4.7 To modify mentor program based upon evaluation results.	4.7 The project director and project coordinator will receive a copy of the revised mentor program procedures manual.	4.7 Individual query	

DIRECT SERVICES TO GIFTED AND TALENTED PROGRAM AREA (CONT'D.)

PROJECT FRAMEWORK: SPECIAL EDUCATION SATELLITE PROJECT

GOAL: To provide gifted and talented students with enrichment experiences using a "mentor program" presented via a telecommunications mode.

OBJECTIVE #: 5. To provide a program of educational enrichment to gifted and talented students during the project's second year.

EXPECTED RESULTS:

5.1 To identify 10 additional LEAs for potential participation in the mentor program.

5.2 To conduct initial screening of potential student participants.

5.3 To assess potential students' interests.

VERIFIABLE INDICATORS

5.1 100% of superintendents of 10 additional LEAs will receive an overview of the program's first year operation and effectiveness and 90% will indicate a willingness to participate.

5.2 300 potential students from 30 LEAs will be administered the initial screening instrument.

5.3 150 of the potential students from the 30 LEAs will be identified and administered the "interest inventory."

MEANS OF VERIFICATION

5.1 Telephone confirmation of receipt and letter of commitment on file in project office.

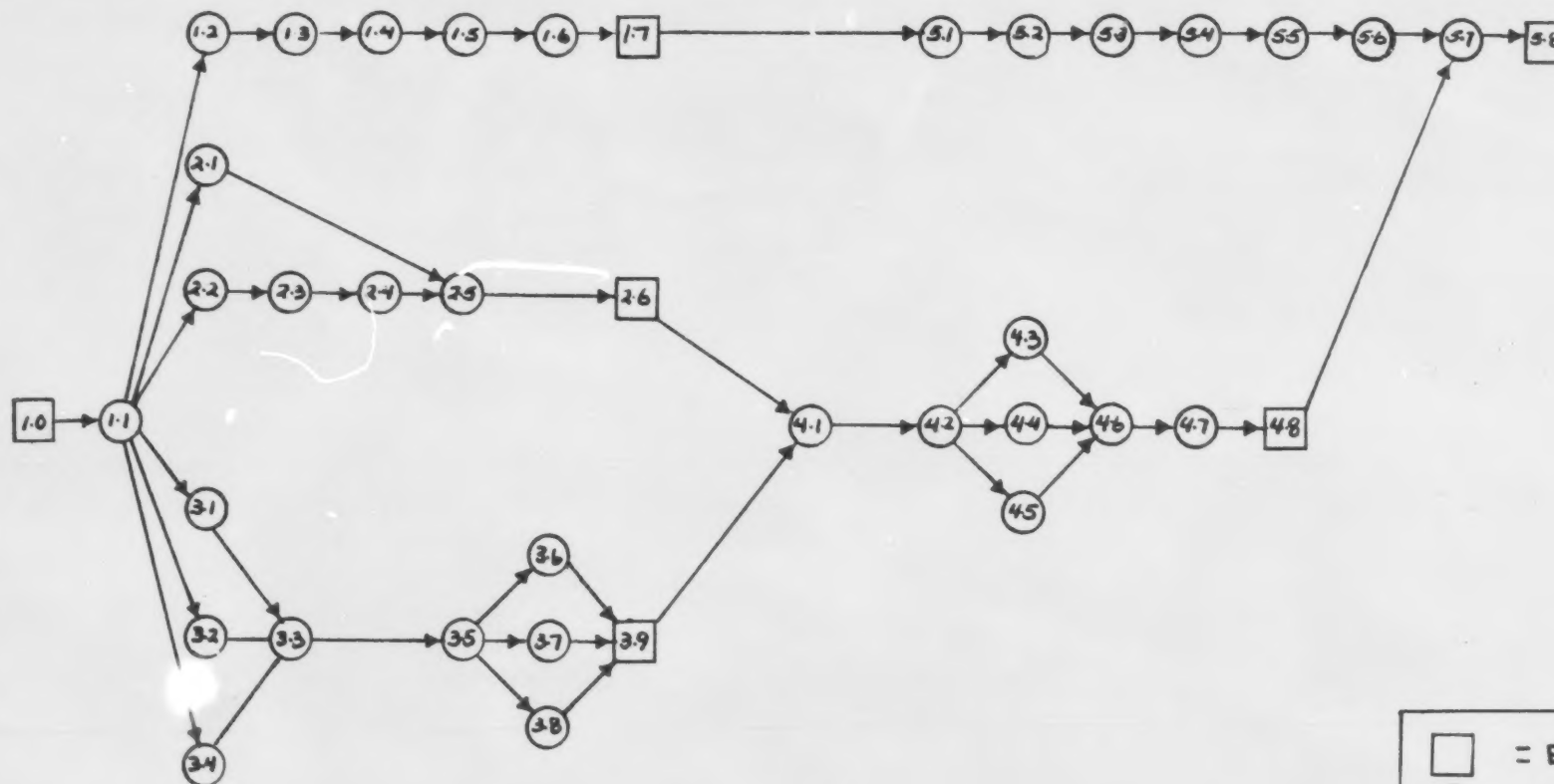
5.2 Completed initial screening instruments will be on file in the project office.

5.3 Completed "interest inventories" will be on file in the project office.

ASSUMPTIONS

DIRECT SERVICES TO GIFTED AND TALENTED PROGRAM AREA (CONT'D.)

EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
5.4 To select student participants.	5.4 Forty student participants (four students representing each of ten different interest areas) will be selected, with two students being selected from each of the twenty LEAs.	5.4 Participant roster will be on file in the project office	
5.5 To identify and select mentors.	5.5 Ten mentors will be selected and each matched to four student participants.	5.5 Letters of commitment from participating mentors	
5.6 To train mentors in use of telecommunications and educational enrichment procedures.	5.6 Ten mentors will each self-administer the mentor training package and prepare learning objectives for each of their respective students.	5.6 Training assessment instruments and lists of student learning objectives will be completed by each mentor and on file in the project office.	
5.7 To operationalize the second year program activities.	5.7 Ten mentors will each conduct as appropriate educational enrichment teleconference activities with their respective four students.	5.7 Mentor program delivery log.	



SPECIAL EDUCATION SATELLITE PROJECT

COUNCIL FOR EXCEPTIONAL CHILDREN

MENTOR COMPONENT ACTIVITY EVENT NETWORK

PROJECT
DIRECTOR

R. WELCH

FIG. 1

NETWORK
DEVELOPER

E. BLACKHURST 3 MAR 78

3. COMMUNITY AWARENESS/PARENT EDUCATION

PROGRAM AREA

This program area contains the following parts:

- o Work Breakdown Structure of Community Awareness/
Parent Education Program Area*
- o Narrative of Community Awareness/Parent Education
Program Area*
- o Project Framework: Community Awareness/Parent
Education Program Area*
- o PERT Chart: Community Awareness/Parent Education
Program Area Activity and Event Network*
- o Schedule for Project "Comm Aware" - Computer-Generated
Table*

WORK BREAKDOWN STRUCTURE
COMMUNITY AWARENESS/PARENT EDUCATION PROGRAM AREA

EVENTS	ACTIVITIES
1.0 Start Community Education Component	1.1 Obtain program area staff 1.2 Convene advisory board 1.3 Determine content for programs 1.4 Establish format for media programs 1.5 Identify potential program participants 1.6 Establish broadcast dates 1.7 Communicate with CATV and PBS stations 1.8 Arrange for production facility
1.9 Program Planning Completed	2.1 Screen identified media 2.2 Write scripts 2.3 Obtain media releases 2.4 Finalize participants 2.5 Do on-site development 2.6 Produce first program 2.7 Produce second program 2.8 Produce third program
2.9 Program Production Completed	3.1 Develop procedures for national interactive panel 3.2 Arrange for participants 3.3 Train interactive panel members 3.4 Schedule interactive panel
3.5 National Interactive Panel Planned	4.1 Develop procedures for local group interaction 4.2 Identify local volunteer leadership 4.3 Develop materials for local groups 4.4 Train local leadership
4.5 Local Arrangements in Place	5.1 Broadcast first program 5.2 Broadcast second program 5.3 Broadcast third program including national panel
5.4 First Year Programming Complete	6.1 Arrange for exposure to 10 local distribution sites 6.2 Produce six programs 6.3 Produce two national interaction programs 6.4 Produce six closed circuit parent programs
6.5 Second Year Program Complete	

COMMUNITY AWARENESS/PARENT EDUCATION

PROGRAM AREA

One of the major intents of this section addresses the fact that all children have the right to a public education appropriate to their individual needs and taking place in the least restrictive environment.

The major objective for this public awareness component is:

To remove or reduce the attitudinal barriers that prevent the acceptance of handicapped persons as full and equal partners in our society.

During the first year of the project, three one-hour community awareness programs on individuals with handicaps will be delivered over the RCA satellite via cable television network to the local communities that are connected to the cable systems that accept delivery of project programming. The programs will consist of appropriate excerpts from media that have been developed by other agencies which will be put together in a unique combination designed to meet the specific objectives and criteria of the project.

In addition, during the first year, program plans will be developed for six closed circuit television broadcasts to parents of handicapped children. This program will be concerned with P.L. 94-142 and the role of the parent in its implementation. This second section is described in "Workplan for Closed Circuit Parent Training", beginning on page 172.

Rationale for Methodology of Community Awareness Section

Barriers exist within the community which hinder the development and provision of education for exceptional children that is appropriate and responsive to the needs of each exceptional child. These are basic negative attitudes or feelings that individuals in the community have towards people with handicapping conditions. Yunker (1977, p. 4) has said that people's attitudes have been acquired as a result of things heard and things experienced.

Recently, the Kentucky State Report (1977) on the White House Conference on Handicapped Individuals addressed the attitudes of the general public towards the handicapped. It is suggested that one way of breaking the attitudinal barriers that interfere with the development of educational programs for handicapped children is to promote widespread use of mass media to provide information about handicapping conditions to the general public with an emphasis on the skills and abilities of those with handicaps.

There is research evidence to support the feasibility of the utilization of media, particularly audiovisual media, to effect attitude change in the non-handicapped population. A tightly controlled study was performed by Donaldson (1974) at the University of Kentucky, which examined the effectiveness of alternative delivery systems.

The results of Donaldson's study indicated that there was little difference between the attitude scores of those who viewed live and video taped presentations. All three groups (live, video, audio) showed significantly more positive attitudes than the control group receiving no presentations.

Both the live and video groups showed more positive attitudes than the audio group.

This briefly described study provides support for the contention that video taped programming and, to a lesser extent, audio programming can be used effectively to modify attitudes that non-handicapped people have toward disabled persons. Consequently, this provides additional rationale and support for the activities proposed in this program component.

The Community Awareness/Parent Education Program Area of this project will develop a program over the four years designed:

- 1) to incorporate factors known to change attitudes of the general community toward persons with handicaps in a positive way and
- 2) to meet the stated needs of handicapped persons for acceptance into the mainstream of society.

This can most effectively be done with the use of mass media such as TV and radio for the dissemination of such information utilizing commercial stations, cable TV, Public Broadcast stations (PBS network), Educational Radio or Instructional TV networks. The use of satellites will increase the number of homes into which this information can be delivered. The RCA/CATV network is viewed as offering the greatest opportunity for this community education component. Two hundred and sixty one private cable companies are connected to the RCA satellite system and this number will increase over time as the demand for CATV increases. Commercial broadcast stations costs are prohibitive to this component. ETV certainly represents another delivery system but at present it is difficult to obtain prime time on this network due to the time committed to children during the day and education programs in the evening.

The community awareness/parent education program area, through the use of the television and radio media followed up with local and national follow-up wire delivery, will seek to positively affect the attitudes of the public towards the handicapped. This will be accomplished through the implementation of the following work plan.

1. Development of program plan for programs for broadcast during last six months of 1st project year.

The planning tasks and procedural tasks will be designed to ensure a comprehensive overall framework for the community awareness program area.

1.1 Obtain program area staff.

The staff for the community awareness/parent education area will be recruited and hired. Each professional staff member will be selected on the basis of education and experience in working in the community with local agencies, liaison with national advisory panels, production of professional quality audiovisual materials and community relations.

1.2 Convene advisory board.

An advisory committee will be established to help select and evaluate the media and to react to the methodology suggested for interaction with the community and evaluation of the projects' effectiveness. The five member advisory committee will be comprised of a handicapped person, parent of an exceptional child, professionals in special and regular education and a member from the community at large.

1.3 Determine content for the programs.

In deciding what information will work best in modifying the public's attitude toward the handicapped, a large scale review and evaluation of available media will be undertaken by the project staff. An initial review of material concerned with educating the public about the handicapped in order to gain greater

SPECIAL EDUCATION SATELLITE PROJECT MATERIALS ANALYSIS FORM			
PUB DATE 1977		COST Not available at this time	CCO
TITLE "OOM Guest and REBOP" Series			PRIMARY MEDIUM
AUTHOR Bureau of Education of the Handicapped			AUDIO TAPE
PUBLICATION TYPE 16 mm - 10 films			AUDIO CASSETTE
			PHONO RECORDS
			FILM STRIP TAPE
			SLIDE TAPE
			VIDEO TAPE
TIME REQUIREMENT			TAPE SIZE
			VIDEO CASSETTE
TARGET AUDIENCE General public, school age children, parents, children with handicaps			16 MM FILM X
AVAILABILITY Charles H. Schuerhoff WGBH-TV 125 Western Avenue Boston, MA 02134		SOURCE OF DESCRIPTION Brochure Distributor not picked as yet	8 MM FILM
			FILM STRIP
			SLIDE
			PHOTO
			GRAPHIC
DESCRIPTORS Handicaps, deaf, blind, cystic fibrosis, L.D., physical handicaps			TRANS PARENCY
			PRINT
			CAI
			CM
ABSTRACT Ten short films about and by handicapped children. Film guests include Paige an 11-year old with Down's syndrome, Dee, a 12-year old born with a physical handicap, Diana with an amputated leg, Mark with a learning disability, Mary who is deaf, Harold who is blind and John who has cystic fibrosis.			RETRIEVAL SYSTEM
			DATA
			OTHER
POTENTIAL APPLICATIONS Classrooms, service clubs, general public, handicapped population, in-service			MEDIUM COLOR
			COLOR X
			B. W.
			MIXED COLOR

Table 9: SAMPLE INITIAL COMMUNITY AWARENESS RESOURCE IDENTIFICATION

acceptance and freedom for such persons has been undertaken. At this time selected materials have been reviewed for target audience, content, media, availability, format and potential use. A sample is included in Table . Identified materials have not been evaluated by project staff for content quality, effectiveness of message, suitability for identified target, effectiveness of format or technical quality or quality/effectiveness of supplemental teaching materials. The following sources have been contacted for suitable media references for the community awareness program area:

- o media producers
- o media distributors
- o various parent groups
- o publishing houses
- o data bases such as:

ERIC Clearinghouse on Exceptional Children, NISCEM

CEC Data Base on Exceptional Children

- o Bibliographic sources including:

Video Program Guide, 1977-78

Department for Human Resources, Bureau for Health Services

National Catalog of Films in Special Education

Agency for Instructional Television

Learning Concepts

After a review/analysis of the most effective programming available on the handicapped, initial content selections will be made with input from the National Advisory Committee. Content selection will be made for the three programs to be aired during the first year. Tentative selection of content will be made for the second year's six programs as well, based on the available materials.

1.4 Establish format for media program.

With the input of the National Advisory Committee, the program staff will develop the format for the three programs. The format will be based on the results of the media review and content determination. The general purpose of the community awareness program will be to provide information that will result in the development of more positive attitudes toward the handicapped among the viewing audience. The programs will be tentatively titled "Special People/Special Things." They will be produced in a video magazine format similar to the CBS program, "Sixty Minutes." The program will feature handicapped, non-handicapped, gifted, and talented people interacting with each other. Care will be taken to avoid stereotypes. Following are several possible features that could be incorporated into each program:

- a. Introduction will be a montage of still and action visuals that have obvious talents from the athletic, entertainment, and political areas. These will be interspersed with visuals of persons with obvious handicaps as represented by wheelchairs or white canes, and persons who have no obvious disabilities. This will be accompanied by voice-over introductory comments and theme music.
- b. Interview will be an on-going feature and will focus on personal details of interviewee's life. Two of these will be in each program. One will feature a well-known person while another will feature a person with a disability.
- c. Panel Discussions will be shown in which disabled person will be interacting either with each other or with non disabled person of similar interest. Participants may be drawn from the Handicapped Scientist Project of the American Association for the Advancement of Science.

- d. Featurettes will be excerpts from previously developed programs.

These will include the "Zoom Guests", "Feeling Free", and "Sesame Street" excerpts. Past featurettes have included learning disabled students, deaf dancers, one-legged skiers, paraplegic teenagers and others. These will also include specialty production, such as a non-narrative vignette featuring a person in a wheel chair and an ambulatory individual, both of whom are engaged in similar tasks (e.g., basketball, travel, etc.). Background music might be "Anything You Can Do, I Can Do Better." This would show both persons excelling in certain areas.

- e. Entertainment will feature well known entertainers without handicaps and others who are handicapped (e.g., Mel Tillis, Jose Feliciano, Ray Charles, Norm Cosby, Eric Kloss, George Shearing, etc.). These will be straight entertainment pieces although the artists may appear on other segments or interviews.

- f. Encounter will present brief oral presentations in a debate fashion that will present alternative views of controversial positions related to the handicapped. There could include several issues as institutionalization, tax relief for the disabled, sterilization, etc. The same two people will present these views during earlier program.

- g. Short spots will be brief segments with "muppet-type" characters and one of which is a grouch. One character might say "The Wheelmen beat the Divers 97 - 83 in basketball today." The grouch would say, "What's special about that?" The response, "This was for the national wheelchair basketball championship."

- h. Special Things would be an ongoing feature in a documentary fashion that would focus on things such as training seeing eye dogs, American Printing House for the Blind, Kurzweil Reading Machine, Opticon, Computer Assisted Instruction, Travel Controls for Automobiles, Stair Climbing Wheelchairs, aides for assisting the physically handicapped, etc.
- i. Barrier Busters would be features on people who have made exceptional contributions to breaking down architectural and psychological barriers that impede the adjustment of disabled persons.
- j. Special People would be in the style of Paul Harvey's "The Rest of the Story" and would focus on the contributions that exceptional people have made and their backgrounds. For example. Einstein, Beethoven, Will Rogers, Bill Bradley, Barbara Jordan, and others all were not recognized early as having potential for making contributions. This would be done primarily via audio.
- k. Letters would provide viewer feedback and comment.
- l. "Commercials" would feature various helping agencies such as Vocational Rehabilitation, Association for Retarded Citizens, National Epilepsy Foundation, etc.

Continuity would be provided by a host and hostess who would introduce each feature and would serve as interviewers.

1.5 Identify potential program participants

The communities into which the programs will be broadcast will be identified early in the development of the three programs so that plans may be developed for local follow up. This will be done for communities receiving CATV. Local follow up will be conducted in 25 communities.

1.6 Establish broadcast dates.

The dates for the broadcasts of the television productions will be coordinated

at an early date to ensure national coordination and effective follow up.

1.7 Communicate with CATV and PBS stations.

As televising particular programs with subsequent local viewer follow up is an indepth coordinating task, early contact will be made with both the local CATV and PBS stations that will carry the broadcast. The carrying of the broadcast at the local level is the key to the project and smooth coordination must be ensured through early and positive contact at the local level.

1.8 Arrange for the production facility.

In-house time will be scheduled for the production of each program with each segment planned and accounted for.

2. Produce three one-hour television programs for community awareness towards the handicapped.

Based on the research conducted by the program area staff each of the three one-hour programs will be produced.

2.1 Screen identified media.

All media identified for initial suitability for possible use in the community awareness programs will be formally evaluated. This will include screening by the SESP staff and measurement against specific content and technical criteria.

2.2 Write scripts.

The content of each program will have been determined by the staff, based on the evaluation of identified media and materials. The scripts will be written by the staff and reviewed by the National Advisory Committee. The scripts will contain media excerpts, panel discussion where appropriate and one program will contain a national interactive segment to respond to viewer questions at the time of the broadcast. All of these segments plus others as identified as appropriate will be included in the script development.

2.3 Obtain media release.

Any media used in the three programs will have been released by its original producer for use in the community awareness program. Such releases will be obtained in writing by the SESP staff.

2.4 Finalize Participants.

All those initially selected as potential participants in the programs will be finally screened and selected for each production.

2.5 Do on-site development.

Any out-of-house filming or on-site production work will be done for each of the three productions. This may include, for example, any on-location filming of handicapped or other participant interviews, as well as filming of modified-for-handicapped work facilities.

2.6 Produce first program.

2.7 Produce second program.

2.8 Produce third program.

Each one-hour program will be produced in our own facilities utilizing the SESP program staff. Any outside work required in producing the programs will be sub-contracted.

3. National interactive panel planned.

One of the three programs will have a live-on-air national panel that will react to the program content and respond to questions via a toll-free hot-line from local viewers. This panel will consist of three prominent people. One person will be either a person with a handicap or a parent of a child with a handicap, another a professional in the field of special education and one from the community at large. All three persons are to be currently active and knowledgeable in the area of rights of individuals with handicaps.

3.1 Develop procedures for national interactive panel.

The program area staff will develop the logistics and procedures for organizing and implementing the national interactive panel. This will include instructions for the local participants, hot-line procedures, technical arrangements at broadcast site, panelist responses and response modes, cueing procedures and other arrangements.

3.2 Arrange for participants.

The participants for the interactive panel will be finalized with all consulting/travel arrangements made. Scripts, if required, and other production information (both content and technical) will be distributed.

3.3 Train interactive panel members.

The panel members will receive all necessary training required for interactive panel participation for the televised segment. This will include response modes, content review (if necessary), cueing procedures and broadcast awareness. All training will be conducted on the local site by SESP program area staff.

3.4 Schedule interactive panel.

The interactive panel will be scheduled for broadcast during one of the three programs, depending on content. The three programs will have previously been scheduled (1.6) and the scheduling of the panel will fall on one of the previously-determined dates.

4. Arrangements for local group interaction.

Viewers from individual homes will be invited to respond to the one interactive program through questions called in to panelists.

Groups of viewers will be located in 25 local community sites across the nation who will also respond to the national broadcast. However, the groups at these sites will have a greater level of local interaction.

The following is a list of possible options the local sites may wish to implement for greater community outreach.

- o Invitational closed circuit preview for those involved in community program, including press.
- o Telephone referral service to/from TV stations and other locations.
Use local resources.
- o Local advertising campaign involving all media.
- o Local panels
 - 30 minute live on-air panel to discuss views on national presentation, local implications of issue and/or to answer general call-in questions (panel to be composed of parents-professionals-handicapped-community).
 - Telephone resource panel (off-air) of experts to answer questions. This could be on going series, use of different experts at different times.
 - Radio panel of experts - immediately following national program to answer questions called in at time of national program.
- o Studio audience to have direct telephone line to national panel utilizing Teletype (TTY) hook-ups when possible.
- o Groups in community to have direct line to national panel or to studio where relayed to national panel or direct line to local panel.
- o Develop a packet of ideas for use by TV stations for community outreach including sequence of activities, sample letter, other resources, etc.
- o Contact National organizations - Set up system of communications, publicity to state and local groups for involvement in local outreach and evaluative feedback on impact locally.
- o Dial-a-telephone tapes service with more information on particular topic discussed.

- o Write-ins and call-ins - referred to relevant agencies for answering queries of callers; bank of operators for call-ins; one write-in location (TV, radio stations, library). Volunteers to handle mail. Could be referred by telephone or mailed list of agencies.

4.1 Develop procedures for local group interaction.

Guidelines for community involvement including local publicity procedures, interactive audience participation activities and procedures for active involvement of local agencies will be furnished to participating local volunteer groups. Evaluative data collection will also be conducted by the local volunteers and training for this component will be conducted in the 25 sites.

4.2 Identify local volunteer leadership.

Volunteer groups such as the PTA, Junior League, local ARC, CEC. etc., will be selected and trained to organize and lead the discussion and responses at the local level. Print materials will be developed to accompany the group meetings. The level of local outreach participation will be the option of the local residents.

4.3 Develop materials for local groups.

Content materials and leadership guides will be developed by SESP staff for use by volunteer leaders at the local sites. These materials will be developed in addition to the procedural guidelines described in 4.1 which will also be disseminated at the local level.

4.4 Train local leaders.

The volunteer groups acting as leaders in the local response for the interactive panel segment of one community awareness program will be trained by SESP

staff in use of the hot-line, phrasing of questions, response mode, and other sensitivities that will contribute to the overall effectiveness of the program in increasing the public's knowledge of and sensitivity to handicapped individuals within the local community.

Although there will be one scheduled interactive program, if the local volunteer groups desire, they may organize community viewing and discussion groups for the other two broadcasts. One of the elements of selection of content will be, of course, relevance to the community and the increase of community awareness. Should the local volunteer group wish to organize for the other two programs on community viewing, in addition to "at home" viewing, the SESP staff will support their activity in as much depth as resources permit.

5. Complete first year's programming.

All three programs will be broadcast into twenty-five communities during the first year according to the prearranged and confirmed schedule.

5.1 Broadcast first program.

The broadcast of the first program will include the delivery of the program to the dissemination site. It will also include the delivery of any and all ancillary instructional or content materials to each of the twenty-five local sites for group activity.

5.2 Broadcast second program.

This will be done in a similar manner to 5.1.

5.3 Broadcast third program.

This will be done in a similar manner to 5.1. In addition there will be an indepth evaluation of the three programs by the University of Kentucky using the Discrepancy Evaluation Model (DEM) described on page 241. Particular emphasis

will be placed on the evaluation of the National Interactive Segment. There will be an analysis of viewers' response and an analysis of volunteer leadership responses. These evaluations will result in a revision, where necessary of all materials designed for local use. A report will be developed based on the proceedings of the community awareness programming and the evaluation.

Second Project Year

During the second project year, six programs in community awareness topics will be televised over a national network. Use of the Public Broadcast Service (PBS) network will be explored in addition to using the RCA/CATV system. The program format will be based on the format established during the first project year.

Two of the six broadcasts will be followed by a national panel that will be accessible for interactive audience participation. The interactive community group sites will be increased to 60. The following outline of objectives and tasks delineate the work plan for the second year of activity for the Community Awareness Program Area. They are similar in content to the activities to be conducted during the initial year; therefore, the discussion following each subheading has not been repeated.

6. Develop program plan for second year.

- 6.1 Obtain new staff.
- 6.2 Convene advisory board.
- 6.3 Revise format for media programs.
- 6.4 Determine content for programs; review available media.
- 6.5 Identify potential program participants.
- 6.6 Establish TV networks for broadcasting RCA/PBS.
- 6.7 Establish broadcast dates.
- 6.8 Complete program planning for three programs.
- 6.9 Finalize broadcast arrangements.
- 6.10 Revise network model.

7. Produce six programs second project year.

- 7.1 Write scripts.
- 7.2 Screen existing media.
- 7.3 Obtain media releases.
- 7.4 Finalize participants.
- 7.5 Do on-site filming.
- 7.6 Complete production.

8. Determine national panel of content experts for each of two interactive broadcasts during second year.

- 8.1 Select panel #1.
- 8.2 Select panel #2.
- 8.3 Schedule panel presentation.
- 8.4 Broadcast #1.
- 8.5 Broadcast #2.

9. Delivery of two broadcasts into 60 local sites for group activity.

9.1 Locate local volunteer membership

- a. Develop communication network with local leaders/agencies,
- b. Establish commitment,
- c. Select sites.

9.2 Develop materials for local groups.

- a. Background materials,
- b. Evaluation materials,
- c. Training materials.

9.3 Train local groups

- a. Schedule training,
- b. On-site training.

9.4 Revise procedures manual.

9.5 Revise training manual.

10. Broadcast of six programs.

10.1 Broadcast first program.

10.2 Broadcast second program.

10.3 Deliver third program.

10.4 Broadcast fourth program.

10.5 Deliver fifth program.

10.6 Broadcast sixth program. Broadcasts for all six programs contain the following activities:

- a. Deliver program to dissemination site,
- b. Deliver ancillary materials to 25 local sites for group activity,
- c. Follow-up evaluation procedures.

Subsequent Project Years

During the third project year a series of 12 programs will be broadcast, six on community awareness and six on parenting (to be discussed in the parenting section). Three of the broadcasts are to be followed by a national panel. The interactive local community group sites will be increased to 100.

he fourth project year will contain a series of 12 programs that will be broadcast, six on community awareness and six on parenting. Three of the broadcasts are to be followed by a national panel. The interactive local community group sites will be increased to 140.

CLOSED CIRCUIT PARENT TRAINING PORTION OF COMMUNITY AWARENESS PROGRAM AREA

In addition to the three community awareness television programs on the handicapped developed and broadcast during the first project year, six program plans will be developed for closed circuit training targeted toward parents of exceptional children. The following are projected topics for parent programs.

- o Children: Their Rights and Ours
- o Parents and Professionals: An Equal Partnership
- o What Do I want to See in My Child's Education Plan?
- o The Education Plan Looks Great, What Now?
- o Evaluation: What It Is and What It Isn't, What It Can Do -
What It Can't.

- o Are You Sure That's The Right Placement For My Child?
- o What Do I Do When "They" Say My Child Needs Special Help?

All of the six programs will have interactive audience participation with persons having expertise in the program area being taught.

Advisory Committee:

This program component will utilize the National Advisory Committee established for the awareness component and will also bring in consultants on early childhood and parent training education.

Volunteer groups such as the PTA, Junior League, local ARC, CEC, etc., will be selected and trained to organize and lead the discussion and responses at the local level. Print materials will be developed to accompany the group meetings. The following is a sample of the kind of program which might be developed for parents of handicapped children. The content of the six actual programs to be developed during the first year of activity will depend on the research of the Community Awareness/Parent Training staff and available print, audiovisual and human resources.

The following discussion is a scenario describing a program setting for closed circuit parent training.

SCENARIO FOR CLOSED CIRCUIT PARENT TRAINING

Setting: The program setting for parents could be a conference room connected to closed circuit video network such as the Indiana Higher Education telecommunications system (IHETS) which is a statewide, closed circuit network. A system such as this could offer the audience instant talkback for interaction with the televised program. The setting could also be a studio conference room located at the head end of a local cable TV station. In this instance the talkback system could be a dial-up telephone connection to the personnel conducting the program.

Topic: What Do I Want to See in My Child's Plan?

Objective: To inform parents of appropriate content and format of the educational plan, the responsibility of the parents as related to the educational plan, the placement alternatives based on the objectives of the child's plan and what can be done if the plan is not acceptable to the parents.

Pre-Program (15 minutes): A group coordinator

- o Introduces self and program
- o Passes out pre-tests, collects
- o Hands out print material of
 - Objectives
 - Sample appropriate IEP - Education plan checklist
 - Parent options pre, during and post Placement Conference
 - Placement alternatives (program prototypes)
 - Parents' options upon receiving the education plan.

Televised Program Core (30 minutes):

Content 1: Responsibility of schools pre, during and post placement committee meeting and options of parents during same time - 10 minutes.

Format: Two moderators discussing informally, using examples of instances.

Content 2: IEP and Placement Alternatives (program prototypes) - 12 minutes.

a. Format: Existing film or video material - two minute vignettes of program prototypes. Moderators discussing program and child for whom appropriate while films being shown.

b. Moderator: In between vignettes will discuss what some objectives on an IEP might look like for child placed in each of three settings (using visuals).

Content 3: Parents options upon receiving the education plan - eight minutes.

a. Format: Film or video tape of two examples - 1) Parent accepting plan with minor adjustments, 2) Parents rejecting plan.

b. Two moderators discussing options.

c. Post televised program - 15 minutes.

d. Parents to present questions to moderators.

e. Follow-up:

1. Unanswered questions to be picked up and sent to experts - answers mailed to parents.
2. Post-test.
3. Parents' requests for specific information relayed to appropriate agency or parent referred to appropriate source.

Following is the narrative of the work activities required in order to develop the televised programs for the Parent Education Program Area. It should be noted that these are presented in outline form due to the great similarity between the content of the activities in this section and the Community Awareness section. To repeat the narrative of the work involved here would be needless redundancy.

1. Develop Program Plan for Six Programs.

- 1.1 Obtain component staff.
- 1.2 Select five member board.
- 1.3 Select two consultants.
- 1.4 Convene advisory board.
- 1.5 Establish format for programs.
- 1.6 Determine content for programs, review available media.
- 1.7 Identify potential program participants.
- 1.8 Communicate with RCA/CATB stations, PBS/ETV and statewide TV networks; establish interested stations.
- 1.9 Complete program planning for six programs.

2. Establish Volunteer Leadership

2.1 Develop procedures for local group participation.

- a. Establish criteria for selection of site.
- b. Publicity procedures
- c. Interaction procedures groups and media
- d. Develop procedures manual.

2.2 Locate local volunteer leadership.

Contact national groups for local level participation.

2.3 Develop materials for local groups.

- a. Background materials
- b. Evaluation materials
- c. Training materials.

2.4 Train local groups.

- a. Schedule training
- b. On-site training.

2.5 Revise training materials.

3. Produce Six Programs.

- 3.1 Arrange for production facility.
- 3.2 Write scripts.
- 3.3 Screen existing media.
- 3.4 Obtain media releases.
- 3.5 Finalize participants.
- 3.6 Do on-site filming.
- 3.7 Complete production for six programs.

4. Disseminate Six Programs.

- 4.1 Broadcast first program.
- 4.2 Broadcast second program.
- 4.3 Broadcast third program.
- 4.4 Broadcast fourth program.
- 4.5 Broadcast fifth program.
- 4.6 Broadcast sixth program.

Each of the broadcasts of these programs will contain the following components:

- a. Deliver program to dissemination sites.
- b. Deliver ancillary materials to sites.
- c. Follow-up activities with parent volunteers.

Second Project Year

During the second project year, the six programs will be produced and piloted to 10 closed circuit sites around the country. Ancillary material will be developed to accompany the programs. The planning, development and delivery procedures will be similar to those outlined in activities 1.0 through 4.6.

Future Project Years

During the third project year an additional six programs will be produced and piloted to 40 sites. Content will depend upon needs determined during the first two project years. The parenting series will consider topics such as:

- o Available diagnostic and auxillary services.
- o New technology.
- o Basic information on physical care of young children, pregnancy and childbirth.

- o Prenatal hazards and available services.
- o Range of normal development, physical, mental and social.
- o Abnormalities - physical, mental; information, advice and ways of coping.
- o General parental skills and duties.
- o Mutual interaction between parents and children - social, emotional growth.
- o Others - according to expressed needs of consumers.

An additional six programs will be delivered to 100 sites during the fourth project year.

This concludes the discussion of the Community Awareness/Parent Education program area. Further amplifying the objectives, expected results, events and scheduling are: 1) the Project Framework, 2) the PERT Chart, and 3) the Computer-Generated Schedule for the technical assistance area.

COMMUNITY AWARENESS/PARENT EDUCATION PROGRAM AREA
PROJECT FRAMEWORK: SPECIAL EDUCATION SATELLITE PROJECT

GOAL: To increase community awareness regarding the characteristics, needs, rights and abilities of handicapped and gifted individuals as well as provide parents of exceptional children with training designed to facilitate their effective participation in their children's educational/development process by utilizing a combination of appropriate telecommunications delivery systems.

OBJECTIVE #: 1. To develop the network mechanism and implement strategies and to pilot programs that portray exceptional (handicapped) individuals in a variety of roles and social situations which will be broadcast to individual homes and group locations. N of these programs will be followed by audience interaction via land line to a national panel of experts to N sites.

By the end of the first project year
EXPECTED RESULTS:

1.1 To develop a plan of programs for broadcast during last six months of first project year.

1.2 To produce three programs for dissemination during last six months of first project year.

1.3 To follow one of the broadcasts with a national live on-air panel that will be distributed via land-lines to local CATV sites for audience participation.

VERIFIABLE INDICATORS

1.1.1 Written program format
1.1.2 Dissemination plan

1.2.1 Three productions
1.2.2 Ancillary material

1.3.1 N of viewers responding to panel
1.3.2 75% of viewer sample express satisfaction with film and/or panel

MEANS OF
VERIFICATION

1.1.1 Written documentation
1.1.2 Project log

1.2.1 Cassettes
1.2.2 Written documentation

1.3.1 Survey interviews
1.3.2 Project logs

ASSUMPTIONS

1.1.1 Appropriate program resources available

1.2.1 Production facilities available

1.3.1 Local volunteer groups will participate in interaction process

1.3.2 Local groups participate in evaluation component

1.3.3 Sufficient land lines are available

EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
1.4 To provide for 25 receiving sites to have program delivery into group sites in the local communities, such as libraries, conference facilities, etc.	1.4.1 75% of group participants express satisfaction with program 1.4.2 75% of group participants state increased awareness of abilities of persons with handicapping conditions	1.4.1 Questionnaire 1.4.2 Interview structured	1.4.1 Barrier free sites available 1.4.2 Local volunteer groups participate
1.5 To provide a series of three programs on exceptional individuals in a variety of roles and social situations will be broadcast on a national basis via RCA/CATV to <u>N</u> individual homes in <u>N</u> locations during last six months of first year.	1.5.1 Programs produced and broadcast 1.5.2 Broadcasts received by <u>N</u> of potential viewers	1.5.1 Project log 1.5.2 Viewer survey	1.5 CATV stations accept program
1.6 To establish a national model for audience participation and feedback for TV programming.	1.6 Written guidelines	1.6.1 Formal documentation 1.6.2 Procedures manual	1.6 Programs delivered
1.7 By end of the second project year to develop a program plan for six programs.	1.7.1 Revise program format 1.7.2 Dissemination plan	1.7.1 Written documentation 1.7.2 Project log	1.7 Program resources available
1.8 To produce six programs for televised broadcast.	1.8.1 Three productions 1.8.2 Ancillary material	1.8.1 Cassette 1.8.2 Written documentation	1.8.1 Program content available 1.8.2 Production facilities available
1.9 To follow two of the broadcasts with a national panel.	1.9.1 <u>N</u> of viewers responding to panel 1.9.2 75% of viewer sample express satisfaction with film and/or panel	1.9.1 Survey interviews 1.9.2 Project log	1.9.1 Local volunteer groups will participate in interaction process

EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
			1.9.2 Local groups participating in evaluation component 1.9.3 Sufficient land lines are available
1.10 To deliver program to 60 local sites for group interaction.	1.10.1 75% of group participants express satisfaction with program. 1.10.2 75% of group participants state increased awareness of abilities of persons with handicapping conditions.	1.10.1 Questionnaire 1.10.2 Interview structured	1.10.1 Barrier free sites available 1.10.2 Local volunteer groups participate
1.11 To broadcast a national series of six programs over RCA/CATV and/or PBS.	1.11.1 Programs produced and broadcast. 1.11.2 Broadcasts received by <u>N</u> of potential viewers.	1.11.1 Project log 1.11.2 Viewer survey	1.11 CATV and PBS stations accept program
1.12 By the end of the third project year to broadcast a series of 12 programs, six awareness and six on parenting.			
1.13 To follow three of the broadcasts with national panel.			
1.14 To deliver program to 100 sites in local communities for group interaction.			
1.15 By the end of the fourth project year to broadcast a series of 12 programs, six awareness and six on parenting.			
1.16 To follow three of the broadcasts with national panel.			

EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
1.17 To deliver program to 140 local sites for group interaction.			

PROJECT FRAMEWORK: SPECIAL EDUCATION SATELLITE PROJECT

GOAL: To increase community awareness regarding the characteristics, needs, rights and abilities of handicapped and gifted individuals as well as provide parents of exceptional children with training designed to facilitate their effective participation in their children's educational/development process by utilizing a combination of appropriate telecommunications delivery systems.

OBJECTIVE #: 2. By the end of the second project year to deliver a series of six pilot parent training programs through closed circuit television targeted towards parents of exceptional children that will facilitate their most effective involvement and participation in the education process.

EXPECTED RESULTS:

2.1 By the end of the first project year to develop a plan for delivery of six one hour interactive pilot parent training programs over closed circuit TV.

2.2 To establish a volunteer leadership network for ten receiving sites.

2.3 By the end of the second project year to produce six programs for dissemination during second project year.

2.4 To pilot six one hour parent training programs over closed circuit TV to ten sites.

VERIFIABLE INDICATORS

2.1.1 Program outlines
2.1.2 Delivery system

2.2 Network established

2.3.1 Six productions
2.3.2 Ancillary material

2.4.1 75% of parents increased effectiveness
2.4.2 N of parents enrolled

MEANS OF VERIFICATION

2.1.1 Project log
2.1.2 Written documents

2.2.1 Written documents
2.2.2 Project logs

2.3.1 Cassettes/films
2.3.2 Written documents

2.4.1 Questionnaires
2.4.2 Structured interviews
2.4.3 Pre & post tests

ASSUMPTIONS

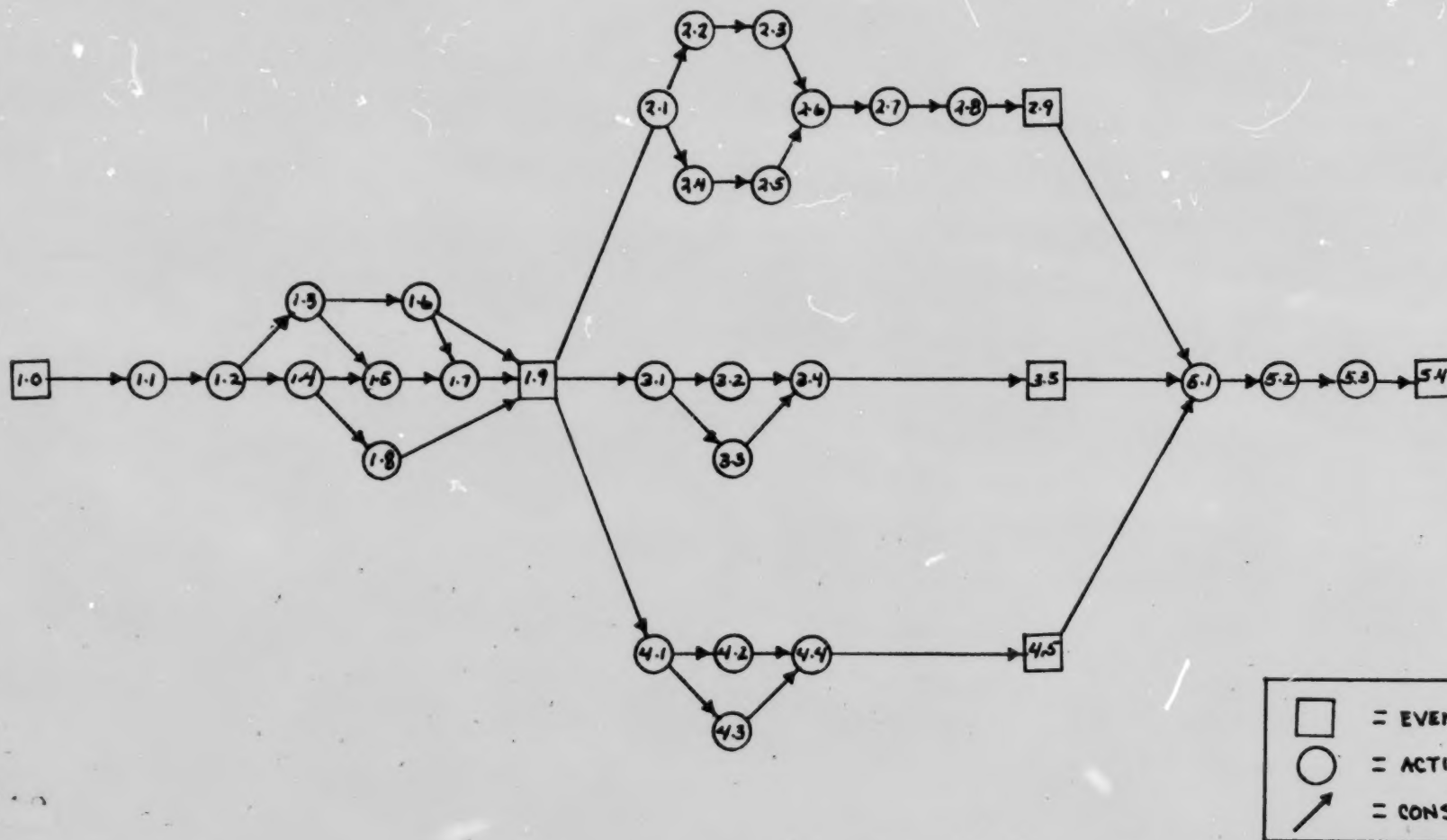
2.1.1 Program non-print materials are available
2.1.2 Closed circuit systems are available

2.2.1 Volunteers available
2.2.2 Sites are available

2.3 Production facilities available

2.4.1 Programs developed
2.4.2 Volunteer network available

EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
2.5 By the end of the third project year to deliver six one hour parent training programs to 40 sites. 2.6 By the end of the fourth project year to deliver six one hour parent training programs to 100 sites.			



SPECIAL EDUCATION SATELLITE PROJECT

COUNCIL FOR EXCEPTIONAL CHILDREN

COMMUNITY/PARENT EDUCATION
COMPONENT SUMMARY ACTIVITY EVENT NETWORKPROJECT
DIRECTORNETWORK
DEVELOPER

R. WELCH

E. BLACKHURST 3 MAR 78

FIG. 2

B. TECHNICAL COMPONENT

This SESP component contains the following parts:

- o Work Breakdown Structure of Technical Component;*
- o Narrative of Technical Component;*
- o Project Framework: Technical Component;*
- o PERT Chart: Technical Component Summary Activity and Event Network;*
- o Schedule for Project, "Technicl" Computer Generated Table.*

WORK BREAKDOWN STRUCTURE OF TECHNICAL COMPONENT

EVENTS	ACTIVITIES
1.0 Start Technical Program Area	1.1 Select and modify facility 1.2 Procure hardware 1.3 Install hardware 1.4 Check out system
1.5 CEC Teleconference Facility Established	2.1 Research Reston/Suitland microwave path 2.2 Submit license application 2.3 Procure hardware 2.4 Install hardware 2.5 Install San Francisco ITFS receiver 2.6 Check out system
2.7 Microwave Links Established	3.1 Develop satellite contract specifications 3.2 Negotiate satellite contract
3.3 RCA Satellite Contract Obtained	4.1 Identify ground network 4.2 Negotiate with CATV companies 4.3 Negotiate with ITFS/microwave operators
4.4 Ground Distribution Network Completed	5.1 Negotiate CTS time with NASA/Lewis 5.2 Attend NASA CTS users meeting
5.3 CTS Network Established	6.1 Research existing terminals in participating agencies 6.2 Negotiate service agreements 6.3 Install terminals 6.4 Train users
6.5 Computer Conferencing System Installed	7.1 Develop equipment specifications 7.2 Order equipment
7.3 Test Equipment Obtained	8.1 Define receiver capability 8.2 Identify CEC site 8.3 Identify UK site 8.4 Identify SF site 8.5 Submit license to operate 8.6 Procure equipment 8.7 Install equipment 8.8 Check out system

WORK BREAKDOWN STRUCTURE TECHNICAL COMPONENT (CONTINUED)

EVENTS	ACTIVITIES
8.9 RCA Receive Systems Installed	9.1 Recruit staff 9.2 Select staff 9.3 Train staff
9.4 Technical and Production Staff Employed	10.1 Operate delivery system
10.2 Second Year Completed	

TECHNICAL COMPONENT

This narrative will assist the reader in understanding the activities required to mount and operate the Technical/Production Component of the Special Education Satellite Project (SESP).

The rationale for selection of these objectives and systems may be found in the alternative approaches section of this proposal on page 39. The SESP proposes to use existing in-place systems: satellite (commercial and experimental), telephone, computer, ITFS, CATV, where system development costs are the least in order to maximize delivery of service at minimized costs.

A substantial on-going effort will be made during the SESP to explore emerging technologies, including satellite and others. This activity will be undertaken to insure the most appropriate delivery system, or combination of systems, for the SESP in the 1980-1985 time frame.

The following is a narrative of activities in the Technical/Production Component, which correspond with the Component Work Breakdown Structure.

1.0 Start Technical Program Area

1.1 Select and Modify Facility. It will be necessary to select a room or group of rooms in the CEC headquarters facility for the production location. Selection criteria will include availability of existing unused/under utilized space, room size, ceiling height, seclusion from adjacent sound and traffic, adequacy of existing power, air conditioning, and lighting, etc. Depending on the facility selected, it may be necessary to remove or add walls, install additional power, lighting and air conditioning, etc.

1.2 Procure Hardware. It will be necessary to delineate the specific design and equipment requirements, seek equipment bids from five qualified dealers, and select the supplier based on price, service and reliability considerations.

1.3 In-Install Hardware. The studio hardware will be installed by project technical &
1.4 staff following design and installation specifications prepared by project management. The system will be tested and approved by project management.

2.0 Establish Microwave Links

2.1 Research Repton/Suitland Microwave Path. In establishing a microwave link between CEC Studio and the RCA earth station at Suitland, Maryland, it is necessary to establish the most direct (line-of-sight) route consistent with terrain, and then to determine which frequencies can be used in that path. Both of these research activities are normally subcontracted to consulting engineers. It is anticipated that Hammett and Edison, or the engineering staff of PSSC would be contracted for this activity.

2.2 Submit License Application. Based on engineering research in 2.1 above, the engineering portion of a license application for construction permit would be prepared by the subcontractor above. The application would then be completed by a law firm with staff specializing in Federal Communications Commission matters. Participants in the SESP consortium have relied on Jones, Day, Revis and Pogue for support in this area in the past.

2.3 Procure Hardware. Technical specifications for equipment for the microwave link would be prepared by project staff based on the data obtained in 2.1 above. Requests for proposals would be let to a minimum of five qualified manufacturers or distributors specializing in this type of hardware; low-bid service and reliability would be critical factors in selection. Examples of equipment and manufacturers can be reviewed in Appendix F.

2.4 Install Hardware. It is anticipated that bids for hardware installation will be let and the installation subcontracted.

2.5 Install San Francisco ITFS Receiver. Staff of the Educational Television Center with experience in microwave/ITFS installation will be contracted to install an ITFS receiver at the RCA headquarters in San Francisco from whence the microwave link to the RCA earth station at Pt. Reyes begins. As part of the planning process, this location has already been probed for ITFS signal strength.

2.6 Check Out System. Both the Washington and San Francisco ground links will be checked out to insure technical quality.

3.0 Obtain Satellite Contract

3.1 Develop Satellite Contract Specifications. Based on the final work plan approved by the National Institute of Education, and the final selection of pilot local education agencies, contract specifications for time/traffic, receive and mix of uplink locations, type of service (live, tape, audio, data, video), a specific contract proposal will be prepared by project staff.

3.2 Negotiate Satellite Contract. A negotiation between project technical and program management staff with RCA will result in a final service contract. As part of the planning contract, preliminary definition has already been prepared and a preliminary proposal from RCA has been received.

4.0 Complete Ground Distribution Network

4.1 Identify Ground Network. Again based on the final work plan approved by NIE and final selection of the LEAs, the ground network will be delineated.

4.2 Negotiate with LATV Companies. Facilitated by RCA and working with appropriate national and state cable associations, negotiations for ground distribution with individual CATV companies will be carried out.

4.3 Negotiate with ITFS/Microwave Operators. In portions of the country, due to limited CATV capability, or the need for regional interconnect of multiple CATV

companies from one satellite receiver, ITFS may be used to reach pilot LEAs. (This technology design is currently being used in California as part of Project Interchange as described elsewhere in this plan.) Technical staff will review existing ground distribution via ITFS and undertake negotiations with ITFS operators as appropriate.

5.0 Establish CTS Network

5.1 Negotiate CTS Time with NASA/Lewis. Access time to the Communications Technology Satellite is coordinated by the Experiments Time Allocation Coordinator (ETAC) NASA/Lewis in Cleveland. Technical staff has several years experience in this process of CTS time allocations.

5.2 Attend NASA CTS Users Meeting. NASA requires all CTS users to attend quarterly users meetings during which the status of the space craft is reported and discussed and the principle investigator of each experiment presents the results and status of his/her experiment.

6.0 Install Computer Conferencing System

6.1 Research Existing Terminals in Participating Agencies. In establishing a computer conferencing network for project management communications, communications with and between participating pilot LEAs, and for the Direct Services to Gifted and Talented Children Program Area, it will be necessary to survey participants in each of these areas to determine existing (computer) terminal capability.

6.2 Negotiate Service Agreements. Service agreements to support each of the three applications will be negotiated with Infomedia Corporation, the application coordinator for the PLANET Computer Conferencing System. Infomedia's capabilities can be reviewed in Appendix G.

6.3 Install Terminals. Based on the data obtained in 6.1 above, computer terminals will be procured and installed where existing facilities are non-existent.

Training sessions in computer conferencing and orientation to PLANET operational procedures will be conducted.

7.0 Obtain Test Equipment

7.1 Develop Equipment Specifications. Type specifications for test equipment required for system set-up, testing and maintenance will be defined.

7.2 Order Equipment. Requests for bids on required test equipment will be solicited from at least five qualified firms.

8.0 Install RCA Receive Systems

8.1 Define Receiver Capability. Based on the geographic area of the country and the immediate environment (proximity of buildings, other transmitters, etc.) C-band receiver technical and operational capability, and specifications will be defined by project staff.

8.2 Identify All Sites: CEC, University of Kentucky, Archdiocese and San

8.3

8.4 Francisco. Actual locations adjacent to the three consortium members' facilities will be identified.

8.5 Submit License to Operate. License applications for operation of the C-band terminals will be obtained from the FCC, either directly by project staff, or through the assistance of the firm supplying the terminal.

8.6 Procure Equipment. Bids on C-band terminals will be requested from at least five qualified firms. Price, the firm's experience, installation capability and service will be determining factors in selection of the firm.

8.7 Install Equipment. Equipment will be installed either directly by project technical staff or subcontracted to the supplier as part of terminal procurement.

8.8 Check Out System. All terminals will be tested and evaluated for technical and operational performance.

9.0 Employ Technical and Production Staff

9.1 Recruit Staff. Technical and production staff will be recruited through standard procedures.

9.2 Select Staff. Technical and production staff will be selected by technical and project management.

9.3 Train Staff. Technical and production staff will be oriented and trained.

10.0 Complete Second Year

10.1 Operate Delivery System. The delivery system will be operated by technical and production staff.

TECHNICAL COMPONENT
PROJECT FRAMEWORK: SPECIAL EDUCATION SATELLITE PROJECT

GOAL: To establish and provide the overall technical support systems necessary to carry out the SESP program objectives.

OBJECTIVE #: 1. To establish a SESP teleconference facility at CEC headquarters.

EXPECTED RESULTS:

- 1.1 To select an appropriate space and make modifications necessary to accommodate a teleconference facility at CEC headquarters.
- 1.2 To procure hardware and equipment.
- 1.3 To install hardware and equipment.
- 1.4 To check out operation of teleconference facility.

VERIFIABLE INDICATORS

- 1.1 Space and modifications necessary for the installation of a teleconference facility at CEC headquarters will be located.
- 1.2 All hardware and equipment necessary to the operation of the teleconference facility will be purchased.
- 1.3 All hardware and equipment necessary to the operation of the teleconference facility will be installed.
- 1.4 100% of hardware and equipment installed in the teleconference facility will operate satisfactorily.

MEANS OF VERIFICATION

- 1.1 County construction permit and approval of modifications
- 1.2 Purchase orders and equipment inventory on file in project office
- 1.4 Engineering report on file in project office

ASSUMPTIONS

TECHNICAL COMPONENT - Continued

PROJECT FRAMEWORK: SPECIAL EDUCATION SATELLITE PROJECT

GOAL: To establish and provide the overall technical support systems necessary to carry out the SESP program objectives.

OBJECTIVE #: 2. To establish the links necessary to connect the Reston facility to RCA-Suitland and the Menlo Park facility to RCA-San Francisco.

EXPECTED RESULTS:

2.1 To research and identify a Reston-Suitland microwave path.

2.2 To submit microwave license application.

2.3 To procure hardware and equipment.

2.4 To install hardware and equipment.

VERIFIABLE INDICATORS

2.1 A microwave path necessary for connecting the Reston facility to RCA-Suitland will be identified.

2.2 An application to operate a Reston-Suitland microwave link will be filed with the FCC.

2.3 All hardware and equipment necessary to the establishment of a Reston-Suitland microwave link will be acquired.

2.4 All hardware and equipment necessary to the operation of the Reston-Suitland microwave link will be installed.

MEANS OF VERIFICATION

2.1 Engineering report on file in project office

2.2 FCC letter of receipt on file in project office

2.3 Purchase orders and equipment inventory on file in the project office

2.4 Engineering installation report on file in project office

ASSUMPTIONS

2.2 A suitable microwave path can be identified and a dish can be erected in Reston

2.3 See Assumption 2.2

2.4 See Assumption 2.3

EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
2.5 To install an ITFS receiver at RCA-San Francisco. 2.6 To check out operation of SESP links to RCA facilities.	2.5 An ITFS receiver will be installed at RCA-San Francisco and thus provide a link with the Menlo Park facility. 2.6 100% of hardware and equipment installed to operate the Reston-Suitland and the Menlo Park-San Francisco links will operate satisfactorily.	2.5 Engineering installation report on file in project office 2.6 Engineering report on file in project office	

TECHNICAL COMPONENT - Continued

PROJECT FRAMEWORK: SPECIAL EDUCATION SATELLITE PROJECT

GOAL: To establish and provide the overall technical support systems necessary to carry out the SESP program objectives.			
OBJECTIVE #: 3. To obtain a contract with RCA to provide satellite transmission time necessary to carry out the project's program objectives.			
EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
3.1 To develop satellite contract specifications.	3.1 A contract will be drafted reflecting all the specifications necessary to carrying out the project's program objectives.	3.1 Approval of draft specifications provided by project management and program coordinators	
3.2 To negotiate satellite contract.	3.2 A contract will be signed with RCA to provide satellite transmission time necessary to carrying out the project's program objectives and that is within the established budget.	3.2 Contract on file in project office	

TECHNICAL COMPONENT - Continued

PROJECT FRAMEWORK: SPECIAL EDUCATION SATELLITE PROJECT

GOAL: To establish and provide the overall technical support systems necessary to carry out the SESP program objectives.			
OBJECTIVE #: 4. To establish the ground distribution network necessary for carrying out the project's program objectives.			
EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
4.1 To identify ground network.	4.1 A ground distribution network necessary for reaching 98% of the pilot sites will be identified.	4.1 Technical subcontractor report on file in project office	
4.2 To secure commitment of CATV companies.	4.2 99% of CATV companies needed to reach the pilot sites will indicate a willingness to participate in the network.	4.2 Letter(s) of commitment from RCA and/or CATV companies on file in project office	
4.3 To secure commitment of ITFS/microwave operations.	4.3 99% of ITFS/microwave operators needed to reach the pilot sites will indicate a willingness to participate in the network.	4.3 Letters of commitment from the operators will be on file in the project office	

TECHNICAL COMPONENT - Continued

PROJECT FRAMEWORK: SPECIAL EDUCATION SATELLITE PROJECT

GOAL: To establish and provide the overall technical support systems necessary to carry out the SESP program objectives.			
OBJECTIVE #: 5. To establish the capability necessary to deliver SESP programming via CTS as appropriate.			
EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
5.1 To negotiate CTS time with NASA/Lewis. 5.2 To attend NASA CTS users meeting.	5.1 A CTS Time Allocation Schedule will be developed which meets the program needs of SESP and is acceptable to NASA/Lewis. 5.2 The technical coordinator and/or project director will participate in 100% of scheduled meetings.	5.1 CTS Time Allocation Schedule on file in project office 5.2 Published list of participants	

TECHNICAL COMPONENT - Continued

PROJECT FRAMEWORK: SPECIAL EDUCATION SATELLITE PROJECT

GOAL: To establish and provide the overall technical support systems necessary to carry out the SESP program objectives.

OBJECTIVE #: 6. To establish the computer conferencing network necessary to providing services for the direct service to gifted/talented and management components.

EXPECTED RESULTS:

6.1 To research the availability of existing terminals at participating sites.

6.2 To negotiate service agreement.

6.3 To install additionally needed terminals.

6.4 To train persons to use the computer conferencing equipment and system.

VERIFIABLE INDICATORS

6.1 100% of sites having terminals compatible with the computer conferencing system will be identified.

6.2 A contract will be signed with the service contractor to provide the additionally needed terminals and the time needed on the system.

6.3 100% of additionally needed terminals will be installed and specified in the service contract.

6.4 98% of persons needing to utilize the computer conferencing system will receive instruction as specified in the service contract.

MEANS OF VERIFICATION

6.1 Engineering report on file in project office

6.2 Signed contract on file in project office

6.3 Installation report from subcontractor

6.4 Report from subcontractor

ASSUMPTIONS

TECHNICAL COMPONENT - Continued

PROJECT FRAMEWORK: SPECIAL EDUCATION SATELLITE PROJECT

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GOAL: To establish and provide the overall technical support systems necessary to carry out the SESP program objectives.			
OBJECTIVE #: To secure the test equipment necessary to ensure satisfactory operation of the SESP telecommunications systems.			
EXPECTED RESULTS: 7.1 To develop test equipment specifications. 7.2 To order and receive needed test equipment.	VERIFIABLE INDICATORS 7.1 Specifications to all necessary test equipment will be delineated. 7.2 100% of all needed test equipment will be ordered and received.	MEANS OF VERIFICATION 7.1 Test equipment specifications report on file in project office 7.2 Purchase orders and equipment inventory on file in project office	ASSUMPTIONS

TECHNICAL COMPONENT - Continued

PROJECT FRAMEWORK: SPECIAL EDUCATION SATELLITE PROJECT

GOAL: To establish and provide the overall technical support systems necessary to carry out the SESP program objectives.

OBJECTIVE #: 8. To install RCA receive systems at each of the three SESP component sites.

EXPECTED RESULTS:

8.1 To define receiver capability.

8.2 To identify a site for the installation of a "C" band ground station at CEC.

8.3 To identify a site for the installation of a "C" band ground station at the University of Kentucky.

8.4 To identify a site for the installation of a "C" band ground station at Menlo Park.

VERIFIABLE INDICATORS

8.1 Specifications regarding the necessary dish size and receiver capability for three "C" band receive stations will be delineated.

8.2 A site suitable for the installation of a "C" band receive-only ground station at CEC will be determined.

8.3 A site suitable for the installation of a "C" band receive-only ground station at the University of Kentucky will be determined.

8.4 A site suitable for the installation of a "C" band receive-only ground station at Menlo Park will be determined.

MEANS OF VERIFICATION

8.1 Engineering report

8.2 Engineering report

8.3 Engineering report

8.4 Engineering report

ASSUMPTIONS

8.2 The necessary frequency can be cleared and a dish can be located at the site

8.3 See assumption 8.2

8.4 See assumption 8.2

TECHNICAL COMPONENT - Continued

EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
8.5 To submit "C" band receive-only station license application.	8.5 An application to operate "C" band receive-only ground station at CEC, University of Kentucky and Menlo Park will be filed with the FCC.	8.5 FCC letter of receipt on file in the project office	
8.6 To procure hardware and equipment.	8.6 All hardware and equipment necessary for installing "C" band receive-only ground stations at CEC, University of Kentucky and Menlo Park will be acquired.	8.6 Purchase orders and equipment inventories on file in the project office	
8.7 To install hardware and equipment.	8.7 All hardware and equipment necessary to the operation of "C" band receive-only ground station at CEC, University of Kentucky and Menlo Park will be installed.	8.7 Engineering installation report on file in project office	
8.8 To check out operation of "C" band receive stations.	8.8 100% of all hardware and equipment installed to operate "C" band receive-only ground stations at CEC, University of Kentucky and Menlo Park will operate satisfactorily.	8.8 Engineering report on file in project office	

TECHNICAL COMPONENT - Continued

PROJECT FRAMEWORK: SPECIAL EDUCATION SATELLITE PROJECT

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GOAL: To establish and provide the overall technical support systems necessary to carry out the SESP program objectives.			
OBJECTIVE #: 9. To secure the personnel necessary to satisfactorily operate the Technical Component of the SESP.			
EXPECTED RESULTS: 9.1 To recruit technical component staff. 9.2 To select technical component staff. 9.3 To train technical component staff.	VERIFIABLE INDICATORS 9.1 One or more applications will be received for each staff position. 9.2 Persons will be hired to fill 100% of technical component staff positions. 9.3 100% of the technical component staff will be provided 16 hours of workshop training regarding the organization, operation, goals, objectives and activities of the project.	MEANS OF VERIFICATION 9.1 Examination of position applications file 9.2 Personnel action forms will be on file in the project office 9.3 Individual query	ASSUMPTIONS 9.1 NIE notification of SESP funding will be obtained on or before August 1, 1978

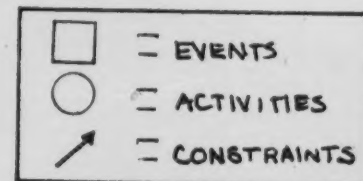
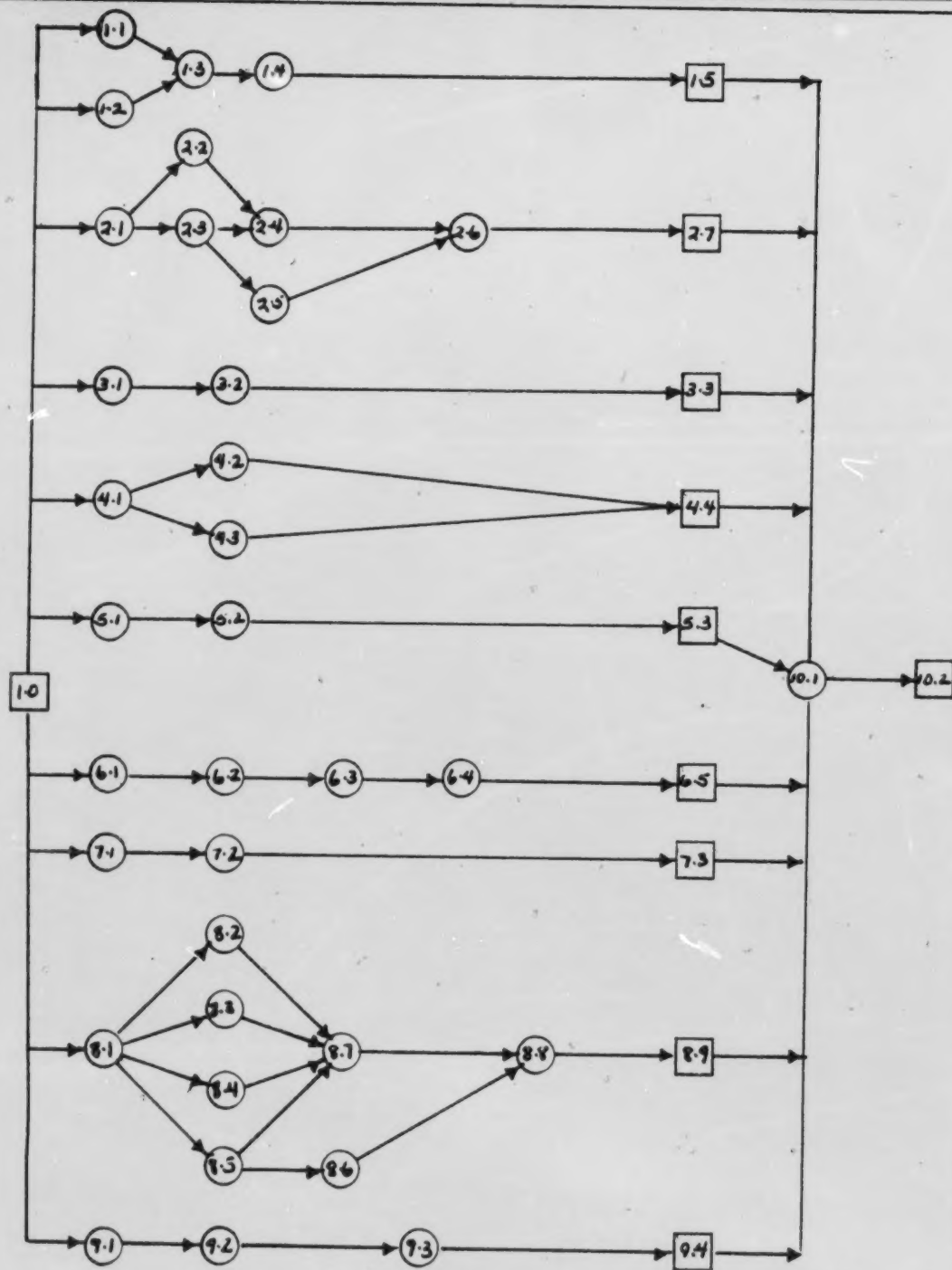
TECHNICAL COMPONENT - Continued

PROJECT FRAMEWORK: SPECIAL EDUCATION SATELLITE PROJECT

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GOAL: To establish and provide the overall technical support systems necessary to carry out the SESP program objectives.			
OBJECTIVE #: 10. To provide technical support systems necessary to carry out the SESP program objectives during the second year of the project.			
EXPECTED RESULTS: 10.1 To refine and operate the technical delivery system activities during the second year of the project.	VERIFIABLE INDICATORS 10.1 See Verifiable Indicators 1.1 through 9.3.	MEANS OF VERIFICATION 10.1 See Means of Verification 1.1 through 9.3	ASSUMPTIONS

TECHNICAL COMPONENT - Continued



SPECIAL EDUCATION SATELLITE PROJECT	TECHNICAL COMPONENT SUMMARY ACTIVITY EVENT NETWORK	PROJECT DIRECTOR	R. WELCH	FIG. 4
COUNCIL FOR EXCEPTIONAL CHILDREN		NETWORK DEVELOPER	E. BLACKHURST	

C. MANAGEMENT COMPONENT

The Management Component contains the following parts:

- o Work Breakdown Structure of Management Component*
- o Narrative of Management Plan*
- o Project Framework Management Component*
- o PERT Chart Management Component, Summary Activity and Event Network*
- o Schedule for Project "Management" - computer-generated table*

TABLE

WORK BREAKDOWN STRUCTURE OF MANAGEMENT COMPONENT

EVENTS	ACTIVITIES
1.0 Management Component Started	1.1 Recruit staff 1.2 Select staff 1.3 Train staff 1.4 Obtain advisory board members 1.5 Determine consultant needs 1.6 Identify/select consultants
1.7 Project Staffed	2.1 Develop requisition system 2.2 Obtain office equipment 2.3 Obtain office supplies 2.4 Obtain office furniture 2.5 Obtain telephone lines
2.6 Offices Supplied and Equipped	3.1 Establish accounting system 3.2 Devise fiscal reporting system 3.3 Develop record keeping system 3.4 Develop subcontracts
3.5 Fiscal System Developed	4.1 Develop project policies 4.2 Develop procedures manual 4.3 Develop filing system 4.4 Develop inter-office communications system
4.5 Project Policies and Procedures Developed	5.1 Develop meeting schedule 5.2 Conduct bi-weekly staff meetings 5.3 Conduct bi-weekly subcontractor teleconference 5.4 Conduct bi-annual subcontractor meetings 5.5 Develop continuation proposal 5.6 Conduct bi-weekly marketing update
5.7 Project Planning Completed	6.1 Conduct second year management activities
6.2 Second Year Completed	

MANAGEMENT OF THE
SPECIAL EDUCATION SATELLITE PROJECT

Management of the Special Education Satellite Project (SESP) will be carried out by four specific Project components: program, technical, evaluation, and management. A Project Director (25%) and Project Coordinator (100%) will coordinate the efficient and effective interfacing of the three Project components' activities in successfully achieving Project's expected results as detailed in the operational plan. The Project Coordinator will also serve as the director of both the program component and management component.

Program Component

The program component will be managed from CEC Headquarters in Reston, Virginia. This component, itself, will consist of three program areas: 1) public awareness/parent education, 2) direct services to gifted and talented, and, 3) technical assistance. The activities of each program area, as delineated in the operational plan, will be managed by a full-time Program Area Coordinator.

The public awareness/parent education Program Area Coordinator will be assisted by one Program Associate and one secretary, the direct service to gifted and talented Coordinator will be assisted by one secretary, and the technical assistance Program Coordinator will be assisted by three Program Associates and one secretary.

At least ten program staff of the Council for Exceptional Children will be readily available to the SESP program staff to serve as consultants, advisors, resource personnel in the delivery of services detailed in the operational plan. These staff represent a vast array of special education and educational administrative experience and currently serve CEC in the area of evaluation, planning and development; government relations; conventions, conferences and training; and information services.

Paid consultants will be utilized by the Program Component to assist the Project staff in continuing needs assessment, materials identification/development, and in facilitating the most effective delivery of services. Consultants will be drawn from, but not limited to, the various constituencies being directly served by the SESP, i.e., public, private and parochial school teachers, administrators, school board members, support services personnel, parents, etc. Consultants will also be drawn from the ranks of those national educational associations which have expressed an interest in working with CEC on such matters: American Association of School Administrators, American Federation of Teachers, National Association of Elementary School Principals, National Association of State Boards of Education, National Association of State Directors of Special Education, National Education Association and the National School Boards Association.

Management Component

The overall management of the SESP will be provided from CEC Headquarters. Assisting the Project Director and Project Coordinator will be an Engineer who will directly coordinate and operate the audio/visual and other technical equipment at CEC. The Engineer will also assist, as needed, in the coordination of activities which interface with the Technical Component.

One secretary and one Administrative Assistant will be assigned to assist in overall project management. They will also serve to facilitate the most effective clerical support of the entire Program staff as well.

A Marketing Specialist will greatly assist the SESP in achieving its goal of ultimately being operated on a total cost-recovery basis. The Marketing Specialist will continuously work with all Project Components in developing and implementing strategies carefully designed to move the project toward this end.

Technical Component

A subcontract will be signed with the Archdiocese of San Francisco to procure and/or provide all the technical services and the management of them as identified in the operational plan. The Technical Component will be directed by a Technical Coordinator. Assisting the Technical Coordinator in the establishment and operation of the various telecommunications networks utilized by the Project as well as in the provision of other needed audio/visual support services will be a Research Assistant. The Research Assistant will also assist in carrying out necessary research into developing satellite based and other telecommunications systems. Additional engineering support services necessary to operating the project will be provided by either a full-time engineer on staff or through a subcontract for specified services with the Public Service Satellite Consortium (PSSC).

Evaluation Component

A subcontract will be signed with the University of Kentucky to manage the Evaluation Component and to provide an evaluation of the services outlined in the operational plan. The Evaluation Component will be directed by an Evaluation Coordinator. Assisting the Evaluation Coordinator in the establishment and operation of the various evaluation procedures will be the equivalent of one fulltime evaluation specialist, a data analyst and secretary. This component will also utilize evaluation consultants in their planning and analysis, as needed.

Coordination of Project Components

Day-to-day management of the interface between and among the program, technical and evaluation components will be provided by the Principal Investigator (25%) and Project Director (100%). Contact will be maintained via telephone, computer teleconferencing, telecopier and U.S. mail.

A bi-weekly telephone conference involving the Project Coordinator, program coordinators, technical coordinator, evaluation coordinator and other consultants as appropriate will be conducted for the purpose of monitoring and facilitating achievement of the expected results for each component. In addition, program marketing staff will meet on a bi-weekly basis to carry out the necessary on-going planning and coordination of the project's program and marketing activities.

A bi-annual meeting of project staff and appropriate consultants will be conducted to review in detail the overall operation of the Project to date, implement specific strategies for dealing with any problem areas that may be identified, and develop specific expected results for each Project component for the ensuing year.

The SESP will have the advantage of utilizing all of the resources available from CEC in conducting all activities associated with the procurement of supplies, equipment and furniture as well as in implementing a fiscal system for the project. The CEC Accounting Unit currently has in place policies and procedures necessary for providing such services to CEC and its other projects, which have a combined total operations budget of \$3,649,627 for 1978-79.

PROJECT MANAGEMENT COMPONENT
PROJECT FRAMEWORK: SPECIAL EDUCATION SATELLITE PROJECT

GOAL: To provide management for the overall operation of the Special Education Satellite Project (SESP)			
OBJECTIVE #: 1: To secure the personnel necessary to satisfactorily manage the SESP.			
EXPECTED RESULTS: 1.1 To recruit SESP staff (management, program, technical and evaluation) 1.2 To select SESP staff 1.3 To train SESP staff 1.4 To determine project consultant needs	VERIFIABLE INDICATORS 1.1 One or more applications will be received for each staff position. 1.2 Persons will be hired to fill 100% of staff positions. 1.3 100% of SESP staff will be provided 16 hours workshop training regarding the organization, operation, goals, objectives and activities of the project. 1.4 Program, Technical, Evaluation, and Management (Project Director & Project Coordinator) Coordinators will prepare reports detailing those activities for which consultants are anticipated as being needed and listing 1 or more potential	MEANS OF VERIFICATION 1.1 Examination of position applicant file. 1.2 Personnel Action Forms will be on file in the Project office. 1.3 Individual query 1.4 Reports on file in Project office	ASSUMPTIONS 1.1 NIE notification of SESP funding will be obtained on or before August 1, 1978.

EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
1.5 To identify and select consultants	consultants for each activity. 1.5 Project Director, Project Coordinator and respective Area Coordinators will match potential consultant talents, availability to the Project consultant needs.	1.5 Consultant to need matrix on file in project office.	

MANAGEMENT COMPONENT

PROJECT FRAMEWORK: SPECIAL EDUCATION SATELLITE PROJECT

GOAL: To provide management for the overall operation of the Sepecial Education Satellite Project (SESP)			
OBJECTIVE #:2: To acquire SESP office supplies and equipment.			
EXPECTED RESULTS: 2.1 To develop SESP supplies and equipment requisition system 2.2 To obtain necessary office equipment 2.3 To obtain necessary office supplies 2.4 To obtain necessary office furniture 2.5 To obtain necessary telephone lines.	VERIFIABLE INDICATORS 2.1 SESP requisition system recognized by and integrated into CEC requisition system 2.2 99% of necessary office equipment will be in place. 2.3 99% of necessary office supplies will be on hand. 2.4 99% of necessary office furniture will be in place. 2.5 100% of telephone lines will be operational	MEANS OF VERIFICATION 2.1 Letter of acknowledgement from CEC controller. 2.2 Visual inspection and office equipment log. 2.3 Visual inspection of inventory. 2.4 Visual inspection and office furniture log. 2.5 Telephone Co. personnel acknowledgement.	ASSUMPTIONS 2.1 Systems are compatible

MANAGEMENT COMPONENT

PROJECT FRAMEWORK: SPECIAL EDUCATION SATELLITE PROJECT

GOAL: To provide management for the overall operation of the Special Education Satellite Project (SESP)			
OBJECTIVE #: 3: To establish and operate a project fiscal system.			
EXPECTED RESULTS: 3.1 To establish an accounting system 3.2 To devise a fiscal reporting system 3.3 To develop a record keeping system 3.4 To develop subcontracts for technical support and evaluation of the Project	VERIFIABLE INDICATORS 3.1 SESP Accounting system recognized by and integrated into CEC accounting system 3.2 SESP fiscal reporting system recognized by and integrated into CEC accounting system 3.3 SESP record keeping system recognized by and integrated into CEC accounting system 3.4 A subcontract will be signed with the Archdiocese of San Francisco, Dept. of Ed. to provide technical support for the project and with the Univ. of Kentucky, Dept. of Sp. Ed. to provide an evaluation of the Project	MEANS OF VERIFICATION 3.1 Letter of acknowledgement from CEC controller 3.2 Letter of acknowledgement from CEC controller. 3.3 Letter of acknowledgement from CEC controller 3.4 Signed contracts on file in the project office Letters of Commitment of subcontract can be reviewed in Appendix I.	ASSUMPTIONS 3.1 Systems are compatible. 3.2 Systems are compatible 3.3 Systems are compatible. 3.4 The Archdiocese and UK will continue to be interested in providing these services

MANAGEMENT COMPONENT

PROJECT FRAMEWORK: SPECIAL EDUCATION SATELLITE PROJECT

GOAL: To provide management for the overall operation of the Special Education Satellite Project (SESP)			
OBJECTIVE #: 4: To develop SESP operational and program policies and procedures			
EXPECTED RESULTS: 4.1 To develop SESP operational and program policies 4.2 To develop SESP operational procedures 4.3 To develop a project filing system 4.4 To develop an interoffice communications system	VERIFIABLE INDICATORS 4.1 100% of project staff will receive a copy of the SESP operational and Program Policies Manual 4.2 100% of project staff will receive a copy of the SESP Operational Procedures Manual 4.3 The project files will be in place 4.4 Staff of the Program Technical and Evaluation components will communicate with each other as appropriate	MEANS OF VERIFICATION 4.1 Individual query 4.2 Individual query 4.3 Visual inspection 4.4 Communication log	ASSUMPTIONS

MANAGEMENT COMPONENT

PROJECT FRAMEWORK: SPECIAL EDUCATION SATELLITE PROJECT

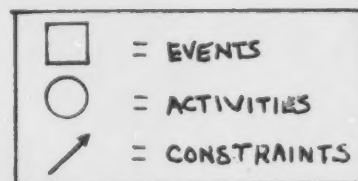
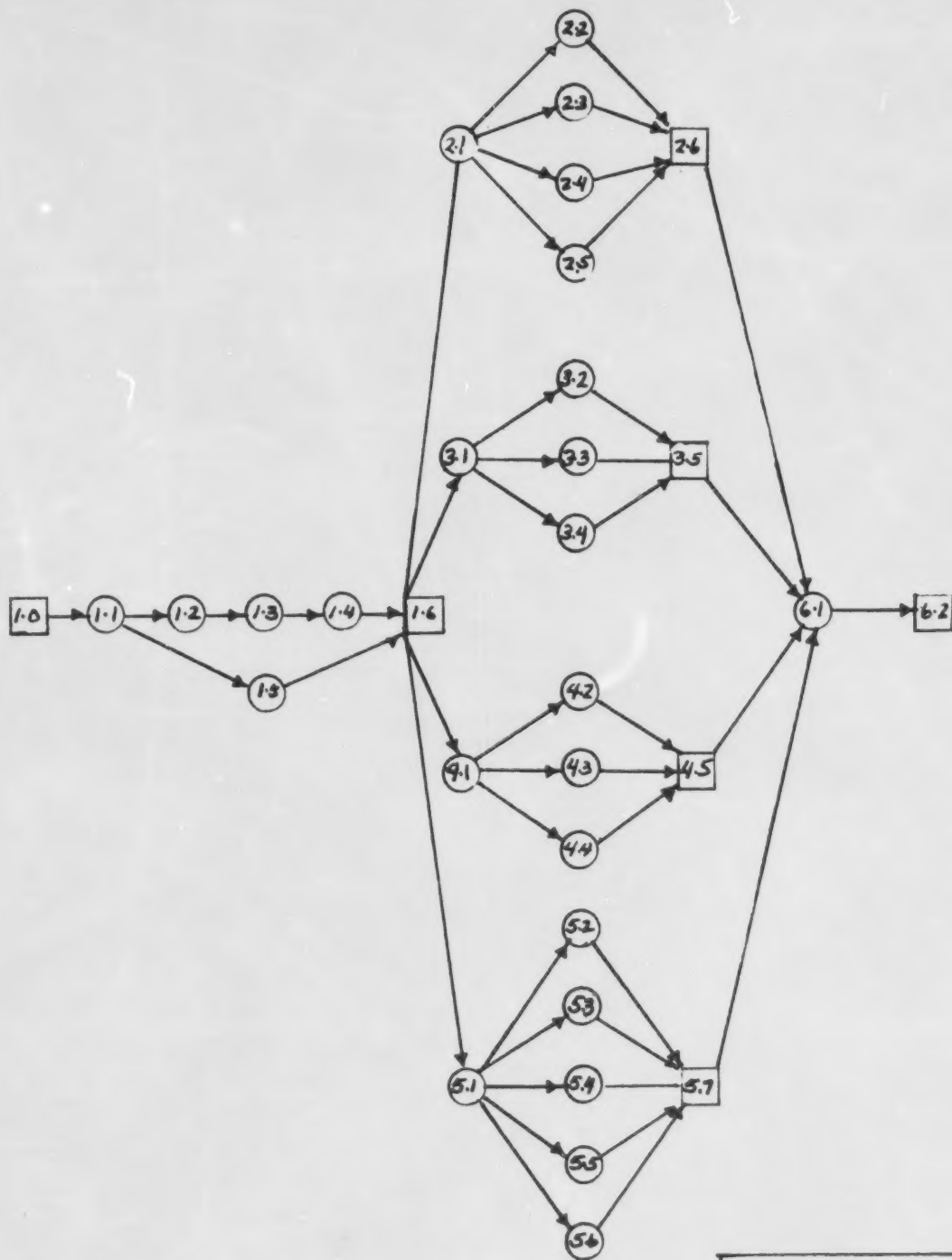
GOAL: To provide management for the overall operation of the Special Education Satellite Project (SESP)			
OBJECTIVE #: 5: To provide for on-going SESP planning and coordination activities			
EXPECTED RESULTS: 5.1 To Develop an annual schedule for all inner and interoffice planning and coordination meetings 5.2 To conduct bi-weekly staff meetings 5.3 To conduct bi-weekly subcontractor teleconference 5.4 To conduct bi-annual subcontractor meetings	VERIFIABLE INDICATORS 5.1 A schedule reflecting all bi-weekly and bi-annual planning and coordination meetings will be distributed to 100% of the staff 5.2 90% of program staff will meet at least every other week for approximately 1.5 hours for the purpose of on-going planning and coordination of project activities 5.3 The project coordinator and each area coordinator will meet at least every other week for approximately 1 hour via telephone conference for the purpose of on-going planning and coordination of project activities 5.4 80% of project staff will meet for approximately 3 days every six months for the purpose of more indepth planning and coordination of project activities	MEANS OF VERIFICATION 5.1 Individual query 5.2 Minutes of the meetings will be on file in the project office 5.3 A summary of the meeting will be on file in the project office 5.4 Minutes of the meeting will be on file in the project office	ASSUMPTIONS

EXPECTED RESULTS:	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
5.5 To develop a specific budget and project framework for activities to be conducted during the following year	5.5 The continuation proposal will be submitted to NIE on or before July 1 of each year	5.5 Proposal on file at NIE	
5.6 To conduct bi-weekly marketing update	5.6 The marketing specialist will, during the bi-weekly staff meetings, provide project staff with an update on marketing activities and solicit the staff input into the marketing strategies	5.6 Marketing update reports on file in project office	

MANAGEMENT COMPONENT

PROJECT FRAMEWORK: SPECIAL EDUCATION SATELLITE PROJECT

GOAL: To provide management for the overall operation of the Special Education Satellite Project (SESP)			
OBJECTIVE #: 6: To provide management for the overall operation of the project during the second year			
EXPECTED RESULTS: 6.1 To refine and conduct project management activities during the second year of the project	VERIFIABLE INDICATORS 6.1 See Verifiable Indicators 1.1 through 5.6	MEANS OF VERIFICATION 6.1 See Means of Verification 1.1 through 5.6	ASSUMPTIONS



SPECIAL EDUCATION SATELLITE PROJECT	MANAGEMENT COMPONENT SUMMARY ACTIVITY EVENT NETWORK 261	PROJECT DIRECTOR	R. WELCH	FIG. 6
COUNCIL FOR EXCEPTIONAL CHILDREN		NETWORK DEVELOPER	E. BLACKHURST	3MART8

 * SCHEDULE FOR PROJECT 'MANAGHNT' *

PROJECT DURATION IS 511 WORK DAYS, WORK WEEK IS 5 DAYS
 WORK IS SCHEDULED TO START ON THE MORNING OF 2 OCT 1978
 AND TO BE COMPLETED ON THE AFTERNOON OF 29 SEP 1980.

26 ACTIVITIES OF WHICH 26 APPEAR ON THIS REPORT OR SCHEDULE
 7 MILESTONE EVENTS OF WHICH 7 APPEAR ON THIS REPORT OR SCHEDULE

THE FOLLOWING USER-ASSIGNED CONSTRAINTS HAVE BEEN USED IN SCHEDULING.

ACTIVITY	55	DEVELOP CONTINUATION PROPOSAL	IS TO FINISH NLT DAY	31 MAR 1979
EVENT	62	*SECOND YEAR COMPLETED*	IS TO OCCUR ON DAY	30 SEP 1980
EVENT	58	*PROJECT PLANNING COMPLETED*	IS TO OCCUR ON DAY	30 SEP 1979

ACTIVITIES ARE SCHEDULED TO START ON THE MORNING OF THE SPECIFIED WORKDAY OR DATE
 AND TO FINISH ON THE AFTERNOON OF THE SPECIFIED WORKDAY OR DATE.

EVENTS ARE SCHEDULED FOR THE MORNING AFTER THE LAST PRECEDING ACTIVITY FINISHES,
 EXCEPT FOR EVENTS OCCURRING ON THE PROJECT COMPLETION DATE.

ACTIVITIES AND EVENTS ARE SORTED ACCORDING TO NODE NUMBERS

'C' IN MARGIN DESIGNATES A CRITICAL ACTIVITY OR EVENT.

HOLIDAYS AND NON-WORKING DAYS FOR PROJECT 'MANAGHNT'

23 NOV 1978
 25 DEC 1978
 1 JAN 1979
 4 JUL 1979
 4 SEP 1979
 22 NOV 1979
 25 DEC 1979
 1 JAN 1980
 4 JUL 1980
 5 SEP 1980

EVENT SCHEDULE

EVENT DESCRIPTION

EARLY TIME

LATE TIME

10 *MANAGEMENT COMPONENT STARTED*
PRECEDES 11

2 OCT 1978
1

11 OCT 1978
8

16 *PROJECT STAFFED*
PPECEDES 21 31 41 51

9 NOV 1978
29

25 NOV 1978
36

26 *OFFICES SUPPLIED & EQUIPPED*
PRECEDES 61

27 MAR 1979
124

8 FEB 1980
347

35 *FISCAL SYSTEM DEVELOPED*
PRECEDES 61

8 DEC 1978
49

8 FEB 1980
347

45 *POLICIES & PROCEDURES DEVELOPED*
PRECEDES 61

8 DEC 1978
49

8 FEB 1980
347

58 *PROJECT PLANNING COMPLETED*
SINK EVENT

28 SEP 1979
255

28 SEP 1979
255

62 *SECOND YEAR COMPLETED*
SINK EVENT

29 SEP 1980
511

29 SEP 1980
511

END OF EVENT SCHEDULE

ACTIVITY SCHEDULE

ACTIVITY DESCRIPTION			DURA- TION	EARLY START	LATE START	EARLY FINISH	LATE FINISH	FREE FLOAT	TOTAL FLOAT
*****			*****						
11	RECRUIT STAFF PRECEDES	12 15	3	20CT78 1	110CT78 8	40CT78 3	130CT78 10	0	7
12	SELECT STAFF PRECEDES	13	15	57CT78 4	160CT78 11	250CT78 18	3NOV78 25	0	7
13	TRAIN STAFF PRECEDES	14	5	260CT78 19	6NOV78 26	1NOV78 23	10NOV78 30	0	7
14	OBTAIN ADVISORY BOARD MEMBERS PRECEDES	16	5	2NOV78 24	13NOV78 31	8NOV78 28	17NOV78 35	0	7
15	DETERMINE NEEDS/SELECT CONSULTANT PRECEDES	16	5	50CT78 4	13NOV78 31	110CT78 8	17NOV78 35	20	27
21	DEVELOP REQUISITION SYSTEM PRECEDES	22 23 24 25	5	9NOV78 29	25SEP79 252	15NOV78 33	10CT79 256	0	223
22	OBTAIN OFFICE EQUIPMENT PRECEDES	26	90	16NOV78 34	20CT79 257	26MAR79 123	7FEB80 346	0	223
23	OBTAIN OFFICE SUPPLIES PRECEDES	26	15	16NOV78 34	18JAN80 332	7DEC78 48	7FEB80 346	75	298
24	OBTAIN OFFICE FURNITURE PRECEDES	26	90	16NOV78 34	20CT79 257	26MAR79 123	7FEB80 346	0	223
25	OBTAIN TELEPHONE LINES PRECEDES	26	10	16NOV78 34	25JAN80 337	30NOV78 43	7FEB80 346	80	303
31	ESTABLISH ACCOUNTING SYSTEM PRECEDES	32 33 34	10	9NOV78 29	11JAN80 327	22NOV78 38	24JAN80 336	0	298
32	DEVISE FISCAL REPORTING SYSTEM PRECEDES	35	10	24NOV78 39	25JAN80 337	7DEC78 48	7FEB80 346	0	298

33	DEVELOP RECORD KEEPING SYSTEM	10	24NOV78	25JAN80	7DEC78	7FEB80	0	298
	PRECEDES 35		39	337	48	346		
34	DEVELOP SUB-CONTRACTS	10	24NOV78	25JAN80	7DEC78	7FEB80	0	298
	PRECEDES 35		39	337	48	346		
41	DEVELOP PROJECT POLICIES	10	9NOV78	11JAN80	22NOV78	24JAN80	0	298
	PRECEDES 42 43 44		29	327	38	336		
42	DEVELOP PROCEDURES MANUAL	10	24NOV78	25JAN80	7DEC78	7FEB80	0	298
	PRECEDES 45		39	337	48	346		
43	DEVELOP FILING SYSTEM	5	24NOV78	1FEB80	30NOV78	7FEB80	5	303
	PRECEDES 45		39	342	43	346		
44	DEVELOP INTER-OFFICE COMMUN SYSTEM	5	24NOV78	1FEB80	30NOV78	7FEB80	5	303
	PRECEDES 45		39	342	43	346		
51	DEVELOP MEETING SCHEDULE	1	9NOV78	20NOV78	9NOV78	20NOV78	0	7
	PRECEDES 52 53 54 55		29	36	29	36		
	56							
52	CONDUCT BI-WEEKLY STAFF MEETINGS	130	10NOV78	5JAN79	15MAY79	6JUL79	30	37
	PRECEDES 57		30	67	159	196		
53	CONDUCT BI-WEEKLY SUB-CON MEETINGS	130	10NOV78	5JAN79	15MAY79	6JUL79	30	37
	PRECEDES 57		30	67	159	196		
54	CONDUCT BI-ANNUAL SUB-CON MEETINGS	130	10NOV78	5JAN79	15MAY79	6JUL79	30	37
	PRECEDES 57		30	67	159	196		
55	DEVELOP CONTINUATION PROPOSAL	25	10NOV78	26FEB79	15DEC78	30MAR79	135	73
	PRECEDES 57		30	103	54	127		
56	CONDUCT BI-WEEKLY MARKETING UPDATE	160	10NOV78	21NOV78	26JUN79	6JUL79	0	7
	PRECEDES 57		30	37	189	196		
61	CONDUCT 2ND YR MANAGEMENT ACTIVS	165	30JAN80	8FEB80	18SEP80	29SEP80	7	7
	PRECEDES 62		140	347	504	511		

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 END OF SCHEDULE

D. EVALUATION COMPONENT

The Evaluation Component contains the following parts:

- o Work Breakdown Structure of Evaluation Component*
- o Narrative of Evaluation Plan*
- o Project Framework Evaluation Component*
- o PERT Chart Evaluation Component, Summary Activity and Event Network*
- o Schedule for Project "Evaluate" - computer-generated table*

TABLE
WORK BREAKDOWN STRUCTURE OF EVALUATION COMPONENT

EVENTS	ACTIVITIES
1.0 Evaluation Staffing Started	1.1 Recruit/select staff 1.2 Develop policies and procedures 1.3 Train all project staff on Discrepancy Evaluation Model
1.4 Evaluation Staffing Completed	2.1 Identify evaluation concerns 2.2 Develop evaluation questions 2.3 Determine data sources 2.4 Specify time lines
2.5 Evaluation Design Completed	3.1 Perform concept analysis 3.2 Identify dimensions of evaluation questions 3.3 Define variables 3.4 Specify standards
3.5 Evaluation Question Analysis Completed	4.1 Design instruments 4.2 Determine instrument use 4.3 Develop administration procedures 4.4 Identify instrument respondents 4.5 Develop data analysis procedures 4.6 Specify evaluation time table
4.7 Evaluation Workplan Completed	5.1 Collect data 5.2 Code data 5.3 Analyze data 5.4 Compare results with standards
5.5 Evaluation Implemented	6.1 Write report 6.2 Print report 6.3 Distribute report
6.4 Evaluation Report Completed	7.1 Second year evaluation plan developed 7.2 Second year evaluation implemented 7.3 Second year evaluation report written
7.4 Evaluation Completed	

EVALUATION PLAN

Procedures for evaluating the effectiveness of this project will be based on the Discrepancy Evaluation Model (DEM) developed by Provus (1971) and adapted for application to special education projects by Yavorsky (1976). For approximately five years, the Division of Personnel Preparation of the Bureau of Education for the Handicapped, U.S. Office of Education, has supported a project known as the Evaluation Training Consortium Project (ETC) at the University of Virginia. This project has provided comprehensive training on the DEM to college and university personnel for all parts of the country. Staff at the University of Kentucky who will be responsible for project evaluation attended three of these three-day intensive training sessions on DEM during the past year and have applied the procedures in a comprehensive personnel development project. The remainder of this section describes the DEM and explains how the model will be applied in the evaluation of this project.

"The DEM defines 'evalaution' as the comparison of what is (a performance), to an expectation of what should be (a standard). If a difference is found to exist between the standard and the performance, this difference is known as a discrepancy. Discrepancies may be positive, where performance exceeds the standard, or negative, where performance is less than the standard. Whereas positive discrepancies are usually welcome, negative discrepancies generally cause concern. Negative discrepancies may be resolved in three ways: an unrealistic standard may be reformulated or redesigned; management may exert greater control over performance; or, if the discrepancy is unmanageable, a program may be terminated." (Yavorsky, 1976.)

This view of evaluation is particularly relevant to the proposed project. The structure of the information presented earlier in the three goal areas is highly

specific in that expected results, verifiable indicators and assumptions are written with a high degree of specificity. In the DEM parlance, these become the standards for evaluation. Data will be collected on project activities which will be viewed as the performance. A comparison of these performance data against the standards will determine whether a discrepancy exists.

One of the most difficult parts of implementing the DEM is the setting of standards that are appropriate and valid. Standards are derived from experience, knowledge and values. Because this project is venturing into areas not previously studied, there is an obvious lack of knowledge and experience that are useful in setting standards. Consequently, standards will initially be based upon estimates, professional judgement, and values. This is one of the reasons for the use of the verifiable indicators. For example, at this point in time, it is not known how many people could potentially be involved as recipients of community awareness information transmitted via CATV. This number is dependent on meeting assumptions about the number of CATV operators who will pick up the programming. It is known that this datum is important to collect; however, the standard cannot be specified at this point in time. After a determination is made of the number of CATV operators, an estimate can then be made of what might be an expected number. Data can then be collected to determine whether performance meets the standard or whether there is a discrepancy. Based upon this information, it then becomes easier to specify a more realistic standard for the next time the same CATV network is used.

Evaluation Stages

As originally conceptualized by Provus (1971), DEM was designed for new or experimental projects. He proposed that five stages of evaluation were applicable: 1) Design Evaluation, 2) Input Evaluation, 3) Process Evaluation, 4) Product Evaluation,

and 5) Cost-Benefit Analysis. Design Evaluation actually precedes program installation, so it does not involve comparing performance to standards. The purpose of this evaluation stage is to make a determination of the adequacy of the plans. Evaluators make a determination at this point of whether the project plans are realistic, whether they appear to be valid, and whether the project is compatible with its environment. For this project as a whole, this will be determined by the persons who review this proposal. External reviewers and NIE staff will make a determination whether the basic design of the project is appropriate and meets criteria established for proposal evaluation. If the project is funded, design evaluation will continue as specific project details are developed. This evaluation will be performed by advisory board members and content experts employed on a consultancy basis.

For the stages of input, process, and output evaluation, performance is compared with standards. Input and process evaluation are essentially types of formative evaluation. As such, the data are used for the purpose of improving project performance.

Input evaluation determines whether the project has been installed as planned. It is concerned with the variables needed to set processes into motion and keep them operating. The major categories of input variables are as follows: 1) Resources are money, staff, equipment, facilities, materials, and services; 2) Receptors are persons, groups, or institutions who the project will attempt to change or serve; 3) Staff are all those employed on the project; 4) Independent groups and organizations are those not employed on the project who are outside program control, but who support or affect program operation; 5) Preconditions are actually more in the

realm of qualifiers than inputs. These relate to characteristics of each of the other inputs. For example, a receptor may be a group of teachers with a precondition being that all are responsible for IEP development; and 6) Enabling outputs from other components. For example, an input on the operation of any of the programs is the existence of an operational satellite delivery system.

Process evaluation monitors the sequential accomplishments of the project activities that enable the accomplishment of objectives. Usually the process variables describe the things that must be done, the interactions of these things, and the context in which they take place.

Output evaluation is essentially summative in nature. It determines whether the objectives and expected results have been obtained. Variables under consideration in output evaluation are generally of three types: 1) Individual change includes change in knowledge, behaviors, attitudes, and abilities; 2) Institutional change includes modifications in the ways in which institutions operate internally and ways in which they interact; and 3) Tangible products can be either products of selection, delivery of information, construction, or analysis. The general output variables for this project have already been specified in the expected results described in previous sections.

The last stage of evaluation is cost benefit analysis. For the DEM, this involves comparison of two or more programs producing the same results. Although cost data will be collected, analyzed, and reported for this project, resources will not permit the operation of more than one program in order to generate a cost comparison data base. However, where other similar projects are located or hypothetical models constructed or extrapolated, cost comparisons will be made.

Procedures

Because resource limitations preclude the evaluation of every variable associated with the project it is important to develop an evaluation plan that will identify those variables of major importance. The evaluation plan will have three primary components: 1) The evaluation design, 2) an analysis of evaluation questions, and 3) an evaluation workplan.

A good evaluation design provides the conceptual structure for the evaluation plan. It insures that questions are being asked that are relevant and clearly relate to the objectives and activities of the project. The evaluation design will include the following items of information:

1. Evaluation concerns are major areas of the project that will be subject to evaluation. There will be an evaluation concern for each objective. A rationale will be prosed for each evaluation concern.
2. Evaluation questions represent the specific questions that will need to be answered in each area of evaluation concern. Although specific evaluation questions will be asked for each evaluation concern, there are several questions that will always be asked in each area. These include the following:
 - a. Was the concept developed, timely and realistic?
 - b. Were resources and people in place and appropriate to the task?
 - c. Did things go as planned during the implementation (or during development in the case of design)?
 - d. Were clients satisfied with the outcome?
 - e. Did clients change as a result of the effort?

- f. Did the "system" change as a result of the effort (e.g., change in social context of organizational structure)?
 - g. Were there unanticipated effects?
 - h. How could each component be improved?
3. Information need will include an explanation of the reason why the evaluation question has been asked, including whether it is formative or summative in nature, or both; what kind of information is sought; and how it will be used, and by whom.
 4. Source of information will describe where performance information will come from and how it will be obtained.
 5. The date when information must be available.

Figure 1 provides a sample of a portion of an evaluation design. It should be apparent that this approach to evaluation design provides an overview of the conceptual structure of the evaluation effort. It shows the parts of the program that will be subject to evaluation and explains, in general terms, how performance data will be sought and used.

After the general evaluation design is completed, the second step will be to prepare an analysis of the evaluation question. This step takes the general evaluation questions identified in the evaluation design stage and defines more specifically the kind of performance information that is necessary to answer the questions posed. Broad concepts are reduced here to specific, measurable variables and the standards against which performance will be measured are generated.

Each evaluation question will be analyzed into a series of sub-concepts that are measureable. Four criteria will be employed to enhance objectivity of measurement.

Each variable must be 1) specific, 2) observable, 3) unidimensional, and 4) clearly suggestive of standards.

Figure 2 provides a sample of the evaluation question analysis form that will be used and illustrates how standards will be stated in relation to evaluation questions.

The third stage will be to develop an evaluation workplan. This portion of the evaluation system focuses upon instruments and data collection. The workplan will contain the following elements: 1) Instrument, 2) Instrument status, 3) Evaluation questions addressed (could be more than one), 4) Administration schedule, 5) Administrators, 6) Respondents, 7) Sample, 8) Data analysis procedures, 9) Data analysts, and 10) Date report must be available. Figure 3 provides an example of a portion of a projected workplan.

Following completion of the workplan, the evaluation system will be implemented, in terms of the actual data collection, analysis, and report preparation. As mentioned earlier, project evaluation will be the responsibility of staff at the University of Kentucky. In order to insure the appropriate communication and collaboration between evaluation staff and project management staff, the responsibilities described in Figure 4 have been assigned to the respective parties.

In order for project staff or external reviewers to determine whether the evaluation plan is adequate, Yavorsky (1976) lists the following criteria for adequacy of evaluation plan. These criteria are:

Theoretical Validity

- o Is the evaluation plan balanced? Does it meet both formative and summative needs? Does the plan include evaluation questions which are input and process-related, as well as output-related?

- o Does the evaluation plan have legitimate emphases? Does it focus on program parts of critical functional importance? Does it reflect priority information needs? Are there valid rationales for the concerns and questions chosen?
- o Will the evaluation plan produce credible information? Are the measures for assuring reliability and validity? Will projected analytic procedures be appropriate to the data?

Political Viability

- o Does the evaluation plan address the information needs of representative internal audiences?
- o Does the evaluation plan meet the information needs of all significant external audiences?
- o Are evaluation procedures described publicly?
- o Are standards for each evaluation question publicly described?

Internal Consistency

- o Are evaluation concerns logically related to the program design?
- o Are evaluation questions logically related to evaluation concerns?
- o Are evaluation questions more specific than evaluation concerns?
- o Are sources of information logically related to evaluation questions?

Face Validity

- o Are sources of information accessible? Will the information that is produced be likely to answer each evaluation question to the satisfaction of all audiences?
- o Are available resources sufficient to implement the evaluation as planned?

- o Are timelines both realistic and functional? Will discrepancy information be available to the various decision-making audiences at the appropriate time in their program review cycles?

Compatibility with Program Environment

- o Does the plan make judicious use of formal and informal program evaluation procedures already in existence?
- o Will measurement procedures be non-disruptive to normal program operation?
- o Does the plan make use of talents and resources in the program's immediate environment (expert statisticians, computer facilities, etc.)?

Sample Excerpt from Evaluation Design

Evaluation Concern	Evaluation Questions	Information Need	Source of Information	Date Information Needed
Interactive 254 278	-Are participant satisfied with interactive seminars? -Do seminars meet the objectives? -What technical problems are encountered in conducting interactive seminars? -How can the seminars be improved?	Formative evaluation data are needed in order to gain feedback that could be used to improve the quality of future interactive seminars. These data might also provide insight into potential problems in other parts of the project that are dependent upon information gleaned from seminars. Summative evaluation data are needed for accountability purposes.	Questionnaires to seminar participants	Within one week of each seminar. 279

Sample Evaluation Question Analysis

Evaluation Question: Are participants satisfied with interactive seminars?

Sub-concept: Adequacy of the interactive seminar experience

Dimensions	Variables	Standards
Time allotments	Amount of time provided for interactions	80% of participants indicate that sufficient time was provided for interaction.
	Amount of time needed for interaction	Participants perception - no standard
Quality of seminar	Clarity of audio and video transmission	90% of participants rate audio and video clarity (separately) as being very good to excellent.
	Content variables related to: -relevance to topic -accuracy of material -specificity of presentation -credibility of panel members	Participants rate degree of satisfaction with each variable. Average rating of 4 or above on 5 point scale.
	Process variables related to: -balance between presentations and interaction -participants remaining on task -skill of moderator	No standard, students report comments for needed modification in Seminar process

Sample Excerpt from Evaluation Workplan

Instrument	Instrument Status	Evaluation Questions Addressed	Administration Schedule	Administrators	Respondents	Sample	Data Analysis Procedures	Data Analysts	Report Available
Interactive Seminar Questionnaire	draft due 1 Jan 79 from Blackhurst	1 A, 2 C	Administered following each interactive seminar	site monitors	Teachers/Administrators	all	Summary statistics including frequency distribution by item, means, & SD; summary of comments	Graduate Assistant	1 week after each seminar

Figure 4

Evaluation Responsibilities of Project Staff

Program Management & Staff	Joint	Evaluation Staff
Understand & accept principles & concepts of DEM	Reach agreement on the purposes of the evaluation & on policies regarding access to evaluation information	Orient program management & staff to DEM principles & concepts
Identify standards		Establish and maintain an apparatus whereby staff may formulate standards
Find ways to resolve differences in standards		Translate standards into program design format
Apply design adequacy criteria & revise standards as necessary		Provide design adequacy criteria & procedures for application
Confirm commitment to program design as an adequate representation of standards		Ensure that program design is technically adequate to serve as a basis for program evaluation
Given evaluation questions, confirm commitment to the viability of the program design at its existing level of development	Identify & prioritize areas of concern & evaluation questions; determine reporting procedures & audiences for specific discrepancy information	Construct an evaluation plan for the collection & analysis of performance information
Suggest possible information sources		Assess adequacy of the evaluation plan
Provide performance information		Collect performance information
		Report discrepancies between performance & standard
Choose between action alternatives to resolve discrepancies	Revise program, design, evaluation plan, & recycle	Assist program staff to interpret discrepancies

EVALUATION COMPONENT
PROJECT FRAMEWORK: SPECIAL EDUCATION SATELLITE PROJECT

GOAL:

OBJECTIVES: To develop and implement a system for conducting formative and summative evaluation of the project that is based on the Discrepancy Evaluation Model.

EXPECTED RESULTS:

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1. Preparation of an evaluation design for project component
2. Evaluation questions analyzed and performance standards specified.
3. Workplan to conduct evaluation activities completed by February 15, 1979.

VERIFIABLE INDICATORS

- a. Evaluation concerns identified
- b. Evaluation questions specified
- c. Data sources identified
- d. Time lines specified
- a. Concept analysis performed
- b. Dimensions of evaluation questions specified
- c. Variables defined
- d. Standards specified
- a. Instruments designed
- b. Procedures for data collection specified
- c. Respondents for data collection identified.
- d. Data analyses procedures determined
- e. Time table specified

MEANS OF VERIFICATION

- a. Existence of written evaluation design
- a. Existence of written analysis for each evaluation question raised.
- a. Presence of written evaluation workplan
- b. Existence of instruments for data collection

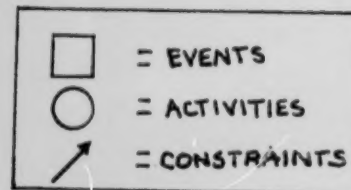
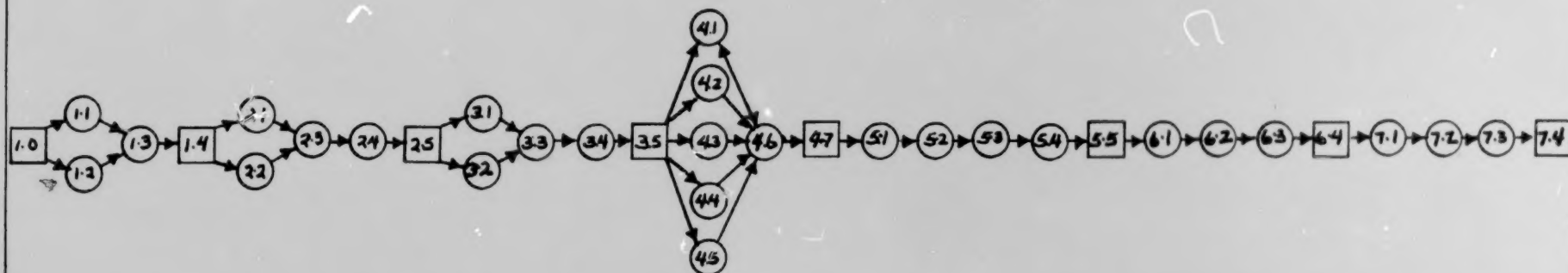
ASSUMPTIONS

- a. Staff and resources would be available
- b. Staff trained on use of DEM model.
- a. Existence of evaluation design prior to question analysis
- b. Cooperation of project staff in jointly developing questions and standards.
- a. Existence of evaluation question analysis prior to development of workplan.

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EXPECTED RESULTS	VERIFIABLE INDICATORS	MEANS OF VERIFICA- TION	ASSUMPTIONS
4. Implementation of evaluation plan.	a. Data collected b. Data coded c. Data analyzed d. Results compared with students e. Reports written	a. Copy of evaluation report.	a. Project staff will participate in data collection.



SPECIAL EDUCATION SATELLITE PROJECT

EVALUATION COMPONENT
SUMMARY ACTIVITY & EVENT NETWORKPROJECT
DIRECTOR

R. WELCH

FIG. 5

COUNCIL FOR EXCEPTIONAL CHILDREN

NETWORK
DEVELOPER

E. BLACKHURST

3 MAR 78

V. PERSONNEL

PERSONNEL AND PROJECT ORGANIZATION

This section examines the skills and experience required of the SESP project staff along with a discussion of the organizational structure of the SESP team. Descriptions of each main staff position in relation to the project mechanism will be delineated following this section of the proposal. The resumes of STET individual staff members and the positions for which they are proposed are presented at the end of the position descriptions.

The requirements of a project such as this dictate careful attention to the organizational structure within which the staff of each component are to operate. The organization of the study lends itself to several component efforts with interrelated responsibilities. The structure of the overall study effort can be viewed in Table 10. There will be four components in the overall study plan; each will fall under the direction of the Project Director. There will be a Program Component comprised of three Program Areas within it (Technical Assistance, Direct Services to Gifted and Talented Students and Community Awareness/Parent Education), a Technical Component to coordinate all telecommunications and other technical hardware planning, production and delivery, a Management Component overseeing all SESP project operations and plans and an Evaluation Component serving to review, evaluate and analyze all project activities utilizing the Discrepancy Evaluation Model (DEM).

Each staff position has been designed on the basis of contribution to the successful completion of this project. SESP project staff positions represent skills, knowledge and experience in the specific areas of telecommunications, special education, evaluation, program coordination, community awareness, teacher education and evaluation.

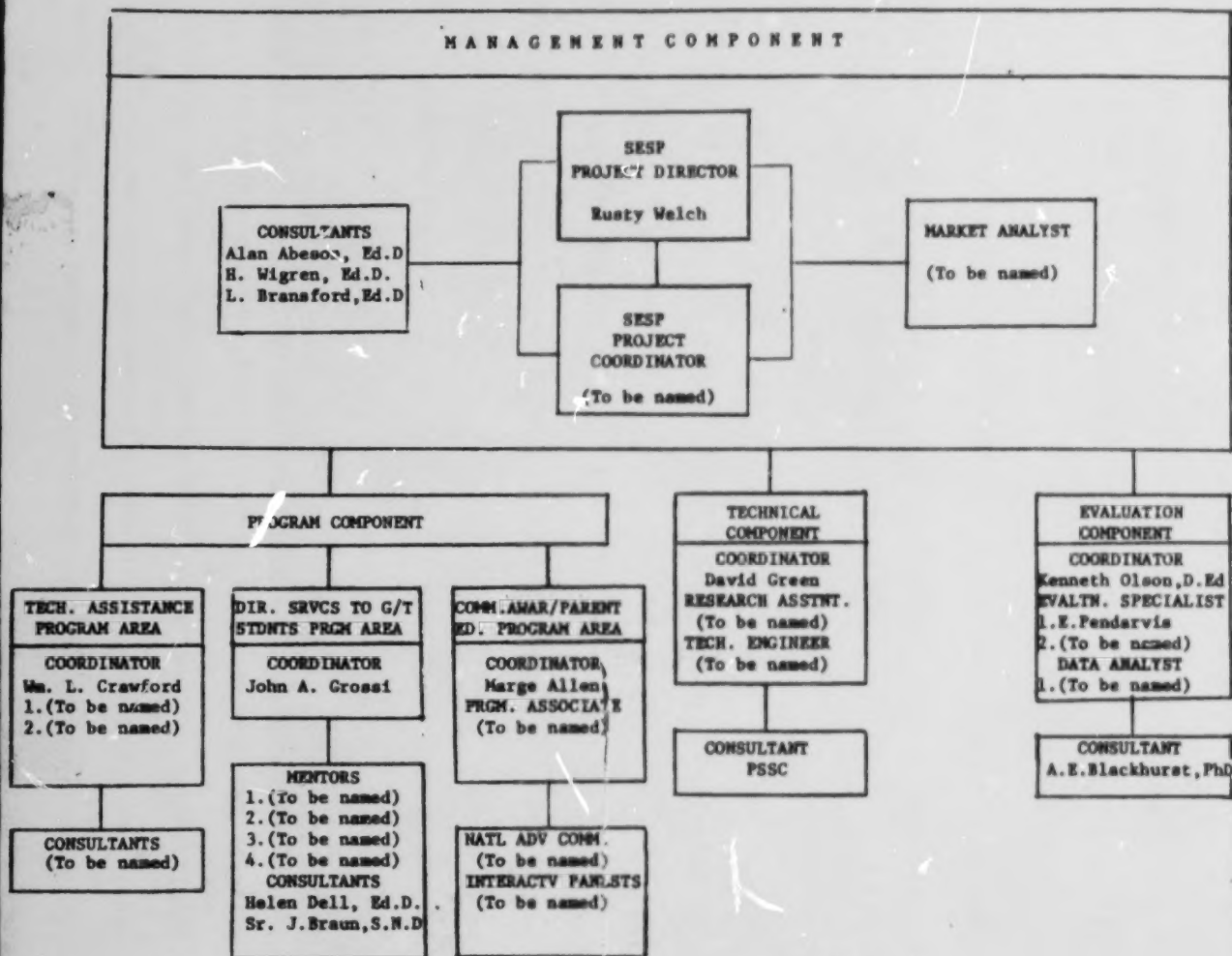


Table 10: SPECIAL EDUCATION SATELLITE PROJECT (SESP) PROJECT ORGANIZATION

While the majority of this chapter focuses upon the description of staff positions, we begin it with a discussion of our approach to structure and management.

CEC philosophy regarding the SESP project development and operation hinges around an intense commitment and involvement in the project activities.

It is the responsibility of the Project Director and Project Coordinator to lead by example. They will review the plans, activities and performance of the SESP project team, and bear the responsibility for the quality and timeliness of the effort. CEC has found that when the staff has this sense of commitment to the individual effort, performance is improved. Further, the project will have a formal review of 30-45 minutes every two weeks. These reviews will be attended by the full project staff, the Project Director and Coordinator. The subcontractors, the Archdiocese of San Francisco and the University of Kentucky will be involved in these conferences via the PLANET teleconferencing system. These meetings are not mere presentations of status to the Project Director and Coordinator. Rather, they will maintain active involvement in project matters and are concerned with technical issues.

SESP Project Director and SESP Project Coordinator

Extensive knowledge/experience/skills pertinent to:

- o Achievement of overall goals of the SESP project in implementing P.L. 94-142 and Section 504;
- o Practice of special education; dedication and commitment to the education of all exceptional children.
- o Long range and short term planning/implementation/analysis capabilities to ensure the meeting of SESP project objectives and goals and the meeting of objectives within each component area;
- o Supervision/management of others through application of effective management techniques;
- o Establishment/maintenance of professional, effective trust relationships with the target populations of the SESP project and with SESP staff;
- o Direction/review documentation of program area finances to ensure budget adherence and cost effectiveness;
- o Preparation/supervision of all required reports pertaining to program area;
- o Involvement with educational personnel at the national level, the state level, and the local level;
- o Development/implementation of instruments required to meet specific SESP program area objectives;
- o Involvement with the target populations of the SESP project (educators, administrators, parents, community members, students); and
- o Conduct/development of oral and written presentations.

Program Area Coordinator

Knowledge/experience/skills pertinent to:

- o Achievement of program area objectives as they relate to the overall goals of the SESP project in implementing P.L. 94-142 and Section 504;
- o Involvement in the education process of exceptional children;
- o Specific content knowledge where required for particular program area;
- o Application of communications technology to be utilized in each program area;
- o Liaison and contact with educational personnel at the State Education Agency and the Local Education Agency levels;
- o Development/implementation of instruments (needs assessments, guides, manuals) to meet specific program area objectives;
- o Previous involvement with the target populations in specific program area (teachers - special and regular, administrators, community members - parents, business/industry representatives, local organization leaders, students);
- o Establishment/maintenance of professional, effective trust relationships with the target populations of each particular program area and with SESP staff;
- o Production sensitivities/capabilities for projection of specific content objectives in media development suitable for particular program area;
- o Coordination of media production required for particular program areas;
- o Identification of resources (within appropriate media) for content development within program area;
- o Conduct of research required for content development within program areas;
- o Conduct/development of oral and written presentations;
- o Supervision/coordination of others within program area through application of effective management techniques;
- o Analysis/organization/scheduling of diverse components of each program area;

- o Preparation/supervision of all required reports pertaining to program area; and
- o Review/documentation of program area finances to ensure budget adherence and cost effectiveness.

Technical Coordinator

The Technical Coordinator is accountable for the overall technical and production development of the project. Works collaboratively with project management and technical staff and consultants in development and operation of the systems necessary to support the project.

Extensive knowledge/experience/skills pertinent to:

- o Administrative experience in communications, preferably in public service applications.
- o Responsibility for identifying and defining a broad range of problems, and for working with appropriate staff and consultants in their solution.
- o Assistance in planning the overall development of the project.
- o Recommendation of appropriate telecommunications systems to meet identified content needs and target groups.
- o Direction of the design, procurement, installation and operation of technical support systems and services.
- o Representation of the project in systems matters.
- o Maintenance of liason with emerging satellite and other telecommunications systems and organizations.
- o Maintenance of liason with Educational Television Center.

Evaluation Coordinator

Knowledge/experience/skills pertinent to:

- o Development/implementation of evaluation systems at state, regional and national levels;
- o Measurement of achievement of goals and objectives of the SESP project in implementing P.L. 94-142 and Section 504;
- o Extensive involvement in the education process of exceptional children;
- o Application of communications technology to be utilized in SESP project;
- o Indepth contact with educational personnel at the State Education Agency and the Local Education Agency levels;
- o Development/implementation of instruments (needs assessment, evaluation, etc.) to meet specific content area objectives (pertinent to Technical Assistance Program Area);
- o Previous involvement with the target populations in the specific program areas and in the technical applications;
- o Establishment/maintenance of professional, effective trust relationships with the target populations of the SESP project and with SESP staff;
- o Conduct/development of oral and written presentations;
- o Analysis/organization/scheduling of evaluation activities pertinent to program area and the technological activities;
- o Preparation/supervision of all data analysis and required reports pertaining to program area;
- o Review/documentation of evaluation area finances to ensure budget adherence and cost effectiveness.

Program Associate

Knowledge/experience/skills pertinent to:

- o Achievement of program area objectives as they relate to the overall goals of the SESP project in implementing P.L. 94-142 and Section 504;
- o Specific content knowledge of program area;
- o Application of communications technology;
- o Contact with educational personnel at the Local Education Agency level;
- o Development/implementation of instruments (needs assessments, guides, manuals, etc.) to meet specific program area objectives;
- o Previous involvement with target populations in specific program area;
- o Establishment/maintenance of professional, effective trust relationships with the target populations of each particular program area;
- o Production sensitivities/capabilities for projection of specific content objectives in media development suitable for particular program area;
- o Assist in media production required for particular program area;
- o Assistance in identification of resources (within appropriate media) for content development within program area;
- o Conduct of research required for content development within program area;
- o Assistance in conduct/development of oral and written presentations;
- o Organizational capabilities for planning, conduct and follow-up of position responsibilities;
- o Assistance in preparation of all required reports pertaining to program area.

Research Assistant

The Research Associate is responsible for coordination of much of the day-to-day technical and traffic operations of the Technical Component, as well as for assisting in the development and execution of an ongoing research and articulation process with emerging technologies.

Extensive knowledge/experience/skills pertinent to:

- o Responsibility for identifying and defining a broad range of problems, and a working with appropriate staff and consultants in their solution.
- o Assistance to the Technical Manager in performance of duties.
- o Coordination of transmission schedules (RCA, CTS, ITFS, CATV).
- o Management of accounts on Computer Conferencing system.
- o Assistance in development and operation of research and articulation process with emerging technologies.

Technical Engineer

The Technical Engineer is responsible for the implementation and operation of the technical support systems of the project. Works collaboratively with staff and consultants to develop and operate the systems necessary to support the project.

Extensive knowledge/experience/skills pertinent to:

- o Responsibility for identifying and defining the technical aspects in a broad range of problem, and for working with Technical Manager, staff consultants and suppliers in their solution.
- o Communications engineering experience; Knowledge of satellite, computer video and telephony technologies.
- o Collaboration with project staff, consultants and suppliers to design, procure, install, operate and maintain the technical support system.

VI. Budget and Cost Sharing

BUDGET AND COST-SHARING

The project budget for year 1 reflects approximately a 15% local contribution and an 85% NIE share. (see separate costing document) During subsequent years, CEC is prepared to assume increasingly greater financial responsibility for the project to the extent that it will be financially self-sufficient by the end of the contract period. In year 2, the local contribution will equal approximately 30% of the project budget, with increases to approximately 50% and 70% in years 3 and 4 respectively.

Strong potential for successfully assuming increasing financial responsibility for the project is reflected in three areas of CEC's current operation:

CEC Information Services and ERIC Clearinghouse on Handicapped and Gifted Children

CEC's Information Center and ERIC Clearinghouse was begun in 1966 through a \$240,000 grant from the Office of Education, Bureau of Research. The program and services expanded significantly during ensuing years with additional federal assistance from the Bureau of Education of the Handicapped (CEC Information Center) and the National Institute of Education (ERIC Clearinghouse) as well as income generated from the limited sale of products and services. By 1974, the total annual budget had risen to \$650,000.

During the subsequent three years, the Council increasingly assumed financial responsibility for the non-ERIC Clearinghouse portion of the Information Services budget. By 1977, the CEC contribution had risen to 100% (\$450,000) and is covered through sales of products and services as well as from other CEC funds.

NIE continues to fund those activities associated with the ERIC Clearinghouse (\$225,000 in 1976).

The CEC Center on Technical Assistance, Training and Information on the Exceptional Person

CEC is recognized as a professional membership association and, as such, provides its 65,000 members with specified membership services in exchange for annual dues. In addition the Council develops and provides a myriad of services for persons concerned about the handicapped and gifted that are not "membership services" and which are paid for by the income which they generate for themselves. These services and activities are planned, developed and coordinated by the Board of Directors of the CEC Center on Technical Assistance, Training and Information on the Exceptional Person. For 1978-79, the Center budget reflects an income of \$1,787,594, expenditures totalling \$1,649,184, and a net operating surplus of \$138,410.

The Special Education Satellite Project (SESP) will serve as an expansion of CEC's commitment to the Center. A focus of subsequent Center services will be the inclusion of satellite and other telecommunications systems of delivery. With a growing demand on the part of local and state education agencies as well as colleges and universities for up-to-date and readily available technical assistance, training and information regarding the education of exceptional children, the potential for successfully utilizing telecommunications applications on a cost-recovery basis seems great.

Consortium of Professional Educational Associations

Under the leadership of CEC, an informal consortium of major national pro-

fessional associations, each having headquarters in the Washington, D.C. area, is forming. Prospective members of the consortium, from whom an informal commitment to participate has been received, include: American Association of School Administrators, American Federation of Teachers, National Association of Elementary School Principals, National Association of Secondary School Principals, National Association of State Boards of Education, National Education Association, and the National School Boards Association. The value of these associations to the development of program resources for the Project is obvious and dealt with in other parts of the proposal.

Currently, these associations are spending considerable sums of money in the delivery of their own technical assistance, training and information to their own constituencies. Several have informally expressed an interest in further considering the potential for using satellite and other telecommunications systems in their various activities. As need develops, CEC will be able to make available to such associations, on a cost-recovery basis, the telecommunications capabilities developed by the Project.

It is for this reason that CEC is investing, as a local contribution to the project, in the installation of a production/teleconference facility at CEC Headquarters with direct microwave access to the RCA uplink facility in Suitland, Maryland. It is felt that such a contribution is clear evidence of CEC's commitment to the proposed project and to the use of telecommunications systems in education. The convenient availability of such a facility should also serve to significantly facilitate the utilization of the telecommunications capabilities of the project

by other Reston and Washington-based educational associations and, thus, enhance the project's potential for future operation on a cost-recovery basis. Ten national educational associations, including CEC, comprise the center for Educational Associations in Reston, Virginia. The Headquarters of eight of the associations are currently, or will soon be, located at the Center.

CEC's experiences and successful performance in the above referenced areas of operation will greatly facilitate the assumption of increasing financial responsibility for the project that is reflected in the following proposed budget. In addition, specific provision for the development and implementation of marketing strategies have been incorporated into the SESP plan. A fulltime project Marketing Specialist will contribute significantly to the adequate development of public/promotional information regarding the project's effectiveness and potential, i.e., news releases, fliers, newsletters, videotapes, filmstrip/audio cassette packages, demonstrations, etc. The Marketing Specialist will also work with all Project staff in identifying the most appropriate specific audiences for such information and strategies for its most effective delivery.

Since the above descriptions indicate "strong potential" rather than "actual commitment", the budget which appears in the separate costing document for the second year is a projection which can be achieved as the Project develops its operational capabilities, the need for services expands and the resources necessary for providing them are realized.

Specific budgets for the project's third and fourth years have not been prepared at this time due to a significant number of uncertainties. Projections today regarding the effects, three years from now, of inflation, changing transportation costs, technological developments, and need for project services would be dubious and indefensible at best.

Specific budgets for these years will be prepared at the end of the first and second year, respectively. They will reflect the cost-sharing formula referenced earlier in this section (local contribution of approximately 50% in the third year and 70% in the fourth).

Qualifications

The Council for Exceptional Children

The long established and continuing purpose, structure, and experience of The Council for Exceptional Children show themselves to not only be compatible with the primary functions of this proposal but to be of sufficient strength so as to bring them to bear on the accomplishment of the project's objectives.

1. Purpose

The Council for Exceptional Children is an association of professional personnel and other persons whose principal purpose is to advance the education of all exceptional children and youth -- both gifted and handicapped -- in the United States and Canada. Since its founding in 1922, information gathering, development, processing and dissemination through product development, training and conferencing have been prominent activities in carrying out the purpose of CEC.

2. Structure

- a. Membership. The 70,000 member organization includes teachers, psychologists, administrators, counselors, college and university level training personnel, researchers, parents, physicians, social workers, lawyers, therapists, consultants, and college and university students in preparation at the undergraduate and graduate levels for special education careers. These persons are employed in public and private schools, universities, clinics, hospitals, and state institutions. Organizationally, CEC members belong to over 975 locally based chapters, and 55 state and provincial federations. They may also be members of one or more of 12 specially focused divisions that include:

Council for Educational Diagnostic Services (CEDS)
Division for Early Childhood (DEC)
Council of Administrators of Special Education (CASE)
Council for Children with Behavioral Disorders (CCBD)
Division on Mental Retardation (CEC-MR)
Division for the Visually Handicapped - Partially Seeing and Blind (DVH)
The Association for the Gifted (TAG)
Division for Children with Communication Disorders (DCCD)
Teacher Education Division (TED)
Division for Children with Learning Disabilities (DCLD)
Division on the Visually Handicapped, Homebound and Hospitalized (DOPHHH)
Division on Career Development (DCD)

This organizational structure provides a communications network connecting members by region through chapter and federation activities and by area of interest through division membership. All divisions publish a newsletter and some have their own journal. Information from the ERIC data base selected by area of interest is currently being supplied to each newsletter for distribution. A similar mechanism for selective dissemination and/or information collection is possible for SESP information. National Headquarters of CEC offers support to division, chapter and state federation activities such as participation in conferences and providing information about the overall CEC projects and areas of thrust. It is conceivable that this structure represents a potential for stimulating, supporting and using nationally directed telecommunications activities in local situations.

b. Governanace. The Delegate Assembly, Board of Governors, President, and Executive Committee constitute the governing bodies of CEC. Various standing and ad hoc committees make recommendations to the organization. One such standing committee is the Interagency Committee that currently has representation of over forty national organizations who are advocates for the handicapped or who represent governmental efforts in support of the handicapped. In addition to these activities, CEC maintains linkages with other organizations, agencies, programs and projects who can provide input to CEC's functions and who serve as modes for dissemination and training. Many of these are located within institutions of higher education, coordinating units, or state education agencies. In addition, these groups may be involved with advisory groups who are yet another extension into the world of education. All of these large alliances and healthy relationships based on professional interests constitute vast reservoirs of resources and a diversity of contacts which could easily be utilized in SESP functions, such as determining content priorities and prepared delivery systems. In other words, the offeror does not conceive of letting the SESP operate as a separate entity alone and without the

benefit of CEC's total advantages. The project will absorb and inherit the combined supports of the whole organization.

- c. Staff. Serving the membership and responsible to the governing bodies are the Executive Director, 5 program units and special projects, which operate at the national headquarters in Reston, Virginia.

- (1) Unit Development. This unit provides direction to all chapter, federation, division, and student CEC officers. Unit Development provides materials and resources for the stimulus of training activities for members through meetings, workshops, and conferences at the local, state, and regional levels. CEC member units often combine resources with each other and other public and private organizations to maximize these delivery efforts. Since the offeror sees this project as being a system belonging to and serving the Nation, CEC will encourage widespread participation in this project. This involvement can readily be facilitated by the cooperative interchange already existing between national CEC and the state federations.

- (2) Membership/Subscription. This unit gives direct attention to membership/subscription processing and all of the services related thereto.
- (3) Conventions and Training. CEC conducts an annual convention that in recent years has attracted 12,000 registrants. The five day convention program is built around content training sessions for all professionals and parents involved with or concerned about the education of exceptional children. In April 1977 at Atlanta, more than 600 different events were offered at the 55th Annual International Convention. One of these included a telecommunications satellite demonstration. The Conventions Unit also organizes regional and/or topical conferences that focus on extensive and varied presentations in a given subject area, such as an IEP conference which was conducted in February, 1978.

Specialized institutes are organized by this unit as well. For example, 16 two day institutes were conducted in Albuquerque in January 1978 on Individualized Educational Program Planning. All CEC institutes can be provided on a contractual replicated basis throughout the country to agencies such as local and state education agencies. All of these training activities provide prime avenues of dissemination and can be designed in such a way as to teach the various user populations about telecommunications resources.

- (4) Governmental Relations. CEC's Governmental Relations Unit works with policymakers at the Federal, state, and local levels to protect and enhance the rights of exceptional children to receive full and

appropriate education and related services. To achieve these objectives, the unit engages in varied activities such as analysis and dissemination of information about pending legislation, laws, governmental policies and procedures, and court actions; training of advocates to improve their skills to influence governmental action and public awareness and support of specific legislation.

In 1974, CEC took a major step forward in building a nationwide base for political activity through the creation of the Political Action Network. PAN consists of Political Action Network Coordinators in each state appointed by the CEC Federation to work with the Governmental Relations Unit in marshalling support for the legal rights of exceptional children. The technical assistance offered by the Governmental Relations Unit in legislative matters is of such a level as to be exceedingly helpful in fulfilling the NIMIS objective to make the data base responsive to the needs of the ultimate user, for example, in translating the concept and meaning of individualized education plans into instructional materials.

- (5) Information Services and Publications. This unit is responsible for the management of the ERIC Clearinghouse on Handicapped and Gifted Children as well as those compatible functions that have, in the past, been conducted under the name of the CEC Information Center. This unit is also responsible for the development and/or production of CEC's four periodicals (Exceptional Children, TEACHING Exceptional Children, Exceptional Child Education

Resources and Update) as well as other information analysis products--books, monographs, bibliographies, and media packages--which have created a current publications list numbering more than 120 titles. Information Services conducts customized computer information searches for clients all over the country and operates a program of selective information dissemination for subscribers. It is in this unit where perhaps the greatest familiarity with information utilization procedures lies. Grapevining, doing conducting needs assessments, developing, producing, updating, making accessible effective reactive and proactive information products and services for various target populations is a constant activity.

3. Experience

a. The CEC Information Center

One major component attesting to CEC's substantial commitment to and capacity for the development, production, marketing and dissemination of educational resources for exceptional children was its operation of the CEC Information Center from June, 1966 to December, 1976.

As of January 1, 1977, CEC assumed full and continuing responsibility for this federally initiated project.

Funding Source: USOE, BEH

Grant: OEG 2-6-062473-1717 (607 G007600050)

Duration: June 1, 1966 - December 31, 1976

Project Officer: Dr. James Moss, Dr. Paul Andereck,
Mr. Elwood Bland

Project Director: Dr. Don Erickson

Description: The CEC information Center program served as a comprehensive bibliographic information retrieval and product development and dissemination center covering research, programs,

administration, teacher education, methods, curricula, services.
and facilities for handicapped and gifted children. A majority of
the activities that were developed in this project with Federal
funds are now self supporting and continue to serve the field.

The Center participated in the ERIC network from 1966 to 1974
as the Clearinghouse on Exceptional Child Education by cataloging,
abstracting, and indexing appropriate documents for ERIC products
such as Research in Education (RIE), and Current Index to Journals
in Education (CIJE).

b. The ERIC Clearinghouse on Handicapped and Gifted

Funding Source: NIE
Contract: 400-76-0119
Duration: September 1, 1974 to present
Project Officer: Dr. Delmer J. Trester
Project Director: Dr. Donald K. Erickson

Description: The Clearinghouse

provides for a continuous review of literature, identifying that which
has relevance for classroom instruction. The entire process of
locating, acquisitioning, selecting, indexing, cataloging, annotating
and storing information is in operation. A variety of appropriate
vehicles for dissemination include user services and products such
as customized computer searches and spot bibliographies.

c. Special Education Instructional Materials Center/Regional Media Center
(SEIMC/RMC) Network Office:

Funding Source: USOE, Bureau of Education for the Handicapped
Grant: OEG-2-6-062473-1717 (607) (a separate part of Information
Center Grant)
Duration: August 1968 - August 1974
Project Officer: Dr. George Olshin, Dr. James Moss, Dr. Paul Andereck
Project Director: Dr. Donald K. Erickson

Description: CEC provided support services for the operation of the National Coordinating Office of the Special Education Instructional Materials Center/Regional Media Center Network. Working directly with 18 regional centers in the United States, the project was designed to identify and provide information about instructional materials that would enhance the learning of handicapped children, to develop, and recommend and evaluate instructional materials.

One of the major functions of the CEC network project was the development and dissemination of data about the SEIMC/RMC system and the initial development of the current Instructional Materials Thesaurus used by NIMIS I.

d. Professional Standards Project

Funding Source: USOE, Bureau of Education for the Handicapped
Grant: OEG-0-72-4306 (603)

Duration: June 30, 1972 - August 31, 1975

Project Officer: Dr. Philip Burke

Project Directors: Drs. Maynard Reynolds and Jean Hebel

Description: During this three year project, CEC developed new standards and guidelines for personnel in the field of special education. The project employed extensive procedures for securing field based input, including Delphi surveys, regional meetings covering the entire United States, and a national consensus meeting. The final set of guidelines was approved by CEC's Delegate Assembly in April 1975. The guidelines are published and disseminated by CEC in book form: Guidelines for Personnel in the Education of Exceptional Children.

e. State-Federal Information Clearinghouse for Exceptional Children (SFICEC)

Funding Source: USOE, Bureau of Education for the Handicapped

Grant: OEG 0-9-182013-3451 (032)

Duration: April 1, 1969 - March 28, 1974

Project Officer: John E. Davis

Project Director: Dr. Alan R. Abeson

Description: This five year project developed a computerized data base containing state law and administrative literature (rules and regulations, policies, guidelines) pertaining to the education of handicapped children. In addition, all rulings of state attorneys general and most of the emerging case law regarding the education of handicapped children were collected and stored for rapid retrieval. This information was processed and analyzed to produce information products which addressed major governmental issues regarding the education of handicapped children.

The continuation of this project has been underwritten financially since 1974 by CEC.

f. Development and Evaluation of State and Local Special Education Administrative Policy Manuals

Funding Source: Bureau of Education for the Handicapped (BEH)

Grant: OEG-0-74-7447

Duration: June 1, 1974 - June 30, 1977

Project Officer: John E. Davis (Tel. 245-9836) Research Program Specialist, BEH

Project Director: Drs. Alan R. Abeson and Scottie Torres

Description: This research project was designed to expand and improve existing state and local special education administrative policies through the development, evaluation and refinement of two comprehensive administrative policy manuals.

In addition to developing the manuals, the project also designed specific dissemination strategies for delivering them to policy makers in key positions to implement comprehensive and modern education programs for handicapped children. The project is generating and disseminating a minimum of eight information products that focus on specific policy areas regarding the education of handicapped children.

g. Vocational Education Policy Project

Funding Source: Bureau of Occupational and Adult Education, USOE

Grant: GOO-7604-704

Duration: September 1, 1976 - February 28, 1978

Project Officer: Velma Brauner (Tel. 245-2617), Research Branch, USOE

Project Director: Sharon Davis

Description: This project had as its goal the development, assessment, and dissemination of a locally focused administrative policy manual regarding the provision of appropriate vocational education to all handicapped students.

The assessment of the draft manual was in part completed through a series of regional conferences where each policy decision and related alternatives will be examined and reviewed by experts in the vocational education of the handicapped. The project planned for the dissemination of the final administrative policy manual.

h. An Analysis of Categorical Definitions, Diagnostic Methods, Diagnostic Criteria and Personnel Utilization in the Classification of Handicapped Children

Funding Source: Bureau of Education for the Handicapped

Grant: 300-7605-15

Duration: October 1, 1976 - September 30, 1977

Project Officer: Joseph Rosenstein (Tel. 245-9836), Research Programs Specialist, BEH

Project Director: Diane Newkirk

Description: This project is analyzed currently used categorical definitions of handicapping conditions in children and related diagnostic methods for identifying such conditions, variations in state and Federal law and official policy regarding definitions, criteria, personnel and diagnostic methods used in classifying handicapped children.

The development of multiple models and implication papers will help to provide a better understanding of the function and effect of current definitions of handicapped children and the diagnostic methods, personnel and criteria used to make such classification decisions. Further, the analytic schemes formulated in this project may provide a framework for future analytic efforts related to the education of the handicapped child.

- i. **A Demonstration of the Effectiveness of a National Training Curriculum for Child Abuse and Neglect for Education through Local, Metropolitan, Regional and Nationally Conducted Activities**

Funding Source: Office of Child Development, Office of Human Development
Grant: 90-C-863

Duration: August 1, 1976 - July 31, 1977

Project Officer: James Harrell (Tel. 755-0593), Children's Bureau,
National Center for Child Abuse and Neglect

Project Director: Dr. Mary A. McCaffrey

Description: The purpose of this project was to use a national training curriculum in child abuse and neglect in training activities for educators of exceptional children. In keeping with OCD's charge, the activities built upon the organizational structure and program of The Council for Exceptional Children to conduct the training activities. Training

was provided at four levels: local, metropolitan, regional and national.

A training manual for use by local chapters and state federations is being developed.

j. Information Services for the Gifted and Talented

Funding Source: Bureau of Education for the Handicapped,
Office of Gifted and Talented

Grant: 300-76-0530

Duration: November 1, 1976 - October 31, 1977

Project Officer: Jane Case Williams (Tel. 245-2482), Deputy Director
OGT, USOE

Project Director: Dr. Donald K. Erickson

Description: The project was concerned with the development and production of the following information products:

A report containing the results of a survey of all state education agencies concerning their programs for gifted and talented children;

A guide to programs currently funded by the U. S. Office of Education, Office of Gifted and Talented, under the Special Projects Act(Section 404);

A series of resource lists, information factsheets and pamphlets on the gifted and talented.

A monograph on prospective program ideas and teaching strategies for the culturally different gifted child.

Conclusion: Given the organization structure and capability of CEC, its highly competent staff, its diversified and geographically distributed membership, and its extensive experience in all aspects of educating exceptional persons both through its regular program and through the projects it has conducted, we submit that The Council for Exceptional Children is preeminently qualified to most effectively carry out those activities delineated in the SESP operational plan.

The University of Kentucky

This section documents the capabilities of the University of Kentucky in areas related to the content of this proposal. The first section will deal with the capabilities of the Special Education Department, the second section will document activities related to the use of satellites, and the third section will describe several related projects in which telecommunications activities (other than satellites) have been performed in the special education area.

A. Special Education Department

1. Educational Programs

The Special Education Department offers a comprehensive array of educational programs ranging from the Bachelors of Arts Degree through the Doctor of Education. At the B.A. level students may prepare to become teachers of children with learning and behavior disorders, moderate retardation, or speech impairment. At the M.A. or M.S. level specialities include early childhood education of the handicapped, severely multihandicapped, career and vocational education for the handicapped, resource teaching, severe learning and behavior disorders, and speech pathology. At the Ed.S. level students may pursue certification as a teacher consultant in special education or director of special education in addition to further developing competencies that were included in the M.A. program. Doctoral level programs prepare persons to assume leadership positions in research, administration, or college teaching.

The Department employs twenty-one (21) faculty members and six (6) secretarial staff. Approximately 380 students are enrolled in undergraduate programs, 50 full-time students in Masters' degree programs, 7 full-time students in Ed.S. programs, and 13 full-time students in doctoral programs. In addition there are approximately 100 graduate students enrolled on a part-time basis in various programs. The Department is fully accredited by the National Council for Accreditation of Teacher Education (NCATE) and the Southern Association of Colleges and Schools. In addition, the Department is a member of the Higher Education Consortium for Special Education (HECSE) which is a consortium composed of the major comprehensive university special education programs in the United States.

2. Research and Demonstration Projects

The Department of Special Education has a strong history of conducting and managing significant federally-funded research, demonstration, and service project projects. Since 1966, projects funded at a level of approximately 9 million dollars have been successfully conducted under the auspices of the Department. These include the following:

- a. Divergent Thinking in Blind Children
- b. University of Kentucky Regional Special Education Instructional Materials Center

- c. Practice What You Preach Project
- d. Programmed Environments Project
- e. Preparation of Special Education Personnel
- f. Mid-East Area Learning Resource Center
- g. National Coordinating Office for Regional Resource Centers
- h. Supplementary Education for Administrators of Resource Centers for the Handicapped
- i. Crusade for Children Scholarship Program
- j. Dean's Mainstreaming Project
- k. Telecommunications for the Severely Handicapped
- l. Alternative Uses of Communication Satellites in the Education of the Handicapped

3. Clinical Programs

The Department of Special Education operates two clinical programs to serve the handicapped individuals in the state and to facilitate the training efforts of the program faculty. The Educational Assessment Clinic provides special education diagnostic services and the development of prescriptive programs for all types of handicapped children who are referred for services. The Speech and Hearing Clinic provides diagnostic and therapy services for children with speech and hearing impairments.

B. Satellite Capabilities

The University of Kentucky is an approved experimenter on both the ATS and CTS satellites. In addition, the Department of Special Education has recently completed a one year study for the Bureau of Education for the Handicapped on alternative uses of communication satellites in the education of the handicapped. These activities will be briefly described below.

1. ATS Satellite

Since 1973, the University has supported the operation of the Resource Coordinating Center for the Appalachian Educational Satellite Project (AESP). During this time coursework and live interactive seminars were broadcast to 15 sites in the Appalachian region in content areas related to reading and career education. The primary focus of these efforts has been on teacher education. The ATS-3 and ATS-6 satellites were used for these purposes. In addition, the University has also been involved in satellite-delivered leadership teleconferences sponsored by the National Education Association.

ATS uplinks and downlinks have been installed at the College of Education complex.

2. CTS Satellite

A CTS uplink and downlink has recently been installed under the auspices of the Lister Hill Medical Experiment. This will be used in the education of nurses in the University Medical Center by instructors

located at the University of Washington. Efforts are also underway to utilize both the ATS and CTS satellites to extend the coverage of this training.

3. Special Education Satellite Project

During the past year, the Department of Special Education conducted a project to explore alternative uses of satellites in the education of the handicapped. The five members of the project staff were actively engaged in literature review, on-site visitation interviewing, and attending meetings and conferences related to utilization of communication satellites. One of the major activities that was conducted on June 1-3, 1977 was a conference of potential users of communication satellites in the education of the handicapped. Approximately 70 persons representing a wide range of disciplines were at this conference. These included specialists in satellite technology, computer utilization, information storage and retrieval, instructional design and development, telephone, television, special education professionals, as well as handicapped consumers.

As part of this conference, two satellite demonstrations were conducted for the participants. The first was a teleconference using one-way video and two way audio between the Archdiocese of San Francisco and the University of Kentucky. The topic of the teleconference was a discussion of barriers to the delivery of educational services to the handicapped and the ways telecommunication technology could be used to overcome these barriers. The teleconference was conducted via the CTS satellite. The NASA Transportable Earth Terminal was utilized for the earth station at the University of Kentucky.

The second demonstration utilized the ATS-6 and ATS-3 satellites to provide a seminar to 14 sites in the Appalachian region as well as the University of Kentucky and the Goddard Space Flight Center. The topic of this seminar was the role of the placement committee in making placement decisions about children with handicaps. A one hour taped simulation of a placement committee was presented followed by a 45-minute panel discussion during which persons from the 16 receiving sites were able to present questions to a panel of experts concerning the provisions of Public Law 94-142 and the role of the placement committee.

The final report of this project will be used by the Bureau of Education for the Handicapped, US Office of Education, in their efforts to develop a policy on the use of communication satellites in special education.

C. Other Telecommunication Activities in Special Education

For the past ten years a number of different projects have been conducted within the Department of Special Education which have used telecommunications other than communication satellites. These are briefly described below:

1. From 1967 - 1973 the Department was tied to the University of Texas for the purpose of information storage and retrieval. Teacher requests for

Information on instructional materials appropriate for handicapped children were teletyped to the University of Texas where they were into the CDC computer. Computer searches were performed and the responses to these were teletyped back to the University. Using a random access microfiche reader-printer, abstracts of the instructional materials were then retrieved and copies of the abstract were printed out for use by the special education teacher.

2. In 1970, a hook-up between the computer at Buffalo State College and the Department was developed for the purpose of retrieving computer based resource units. Teachers would enter descriptive information about the class in which they were teaching. These were then transmitted via teletype directly into the computer at Buffalo and a printout was retrieved which described instructional material and methods and evaluation procedures that were appropriate for the class as a whole or for individual children and subgroups of children within that class. These printouts were then mailed back to the University for distribution to the special education teachers.
3. In 1968, a one-day, state-wide training program on special education instructional materials was telecast through the Kentucky closed circuit network. The broadcast originated from the University of Kentucky TV Center and was beamed to the 9 community college campuses. Arrangement were made for people at those sites to telephone in questions to a panel at the end of the day's session.
4. Two courses on learning disabilities have been broadcast to teachers over Kentucky Educational Television Network. These were combined with on-campus seminars and provisions for phoning in questions to the instructor.
5. Several high quality 2inch color video tapes of special education-related programs have been developed over the years. These include programs on contingency management, behavior modification, procedures for teaching reading, techniques for lifting and transfer of handicapped students, and several public relation-type programs that were made available to commercial stations.
6. A doctoral dissertation was conducted which examined the relative effectiveness of different types of presentations on attitudes toward handicapped individuals. It was found that there were no differences in attitudes when information was presented live by a panel of disabled individuals or when the other group viewed a video tape of that same presentation. Both of these presentations were more effective than just an audio tape of the panel discussion; however, all three modes of presentation were significantly better than a control group that received no information on the topic.
7. Teleconferencing on project management was performed for two years using telephone hook-ups among 17 regional special educational instructional materials centers.

8. For the past two years, a telecommunications project was conducted in which teaching machines were placed in the homes of 18 severely and profoundly handicapped youngsters. These teaching machines were connected by telephone lines to a computer which controlled the programs of the teaching machines and collected data on the utilization of them.

The Archdiocese of San Francisco

The successful and consistent use of advanced systems of technology in providing for the education of all children is dependent upon the acceptance of technological applications by the entire education community and especially by teachers. Their enthusiasm for the advantages offered by technology will eliminate the basic fears of being "replaced by machines." Through Project Interchange, the Archdiocese maintains a dedication to presenting a program of in-service so viable, so obviously advantageous to the practitioners in the field in acquiring skills, developing awareness of possibilities and increasing a motivation for change, that they will demand advanced technological systems as a way in which to learn. This enthusiasm among a few (the group in the model project) will then generate and accelerate teacher use of a highly technological system.

The Archdiocese is committed to building and maintaining the needed enthusiasm for the use of technology by approaching this project as an extension of Interchange in that it provides for "teacher-designed specifications for an information/communication and preparation system" to improve their skills and effectiveness. This approach recognizes that specialized personnel, higher education people and parents may themselves see the feasibility of using technology as a part of the educative process, but if the classroom teacher does not, its use will be on a very limited basis. Therefore, the needs statements of teachers will be reflected in the content, the delivery systems selected will have to be acceptable to teachers and flexible enough to provide for their individual differences, and teacher acceptance must weight heavily in any decisions made in designing the total package of a technologically oriented training program.

In its participation in the SESP, the Archdiocese brings practical and varied experience in telecommunications applications to education. Project Interchange provided much of this experience.

It is a satellite telecommunications project developed by the Archdiocese of San Francisco which operated from 1975 to 1977. Project Interchange I (1975-76) initiated the process of communication among teachers from two California school districts (the Archdiocese of San Francisco and Torrance Unified School District) and utilized the services of the California National Communication Network facilitator Project.

Of great value to the SESP is being able to use the staff and resources of Project Interchange in various project activities including contacting resource persons, reviewing prebroadcast planned materials and excerpts from selected audio-visual materials, and above all input from practicing teachers. With a base of experience in Project Interchange, the Archdiocese views this project as an opportunity to create new models with a variety of formats in telecommunications to increase the range of possibilities for the most effective inservice of a variety of participants. In addition, the experience of other telecommunication research, such as has been done by the Institute for the Future, will be combined with the results of Project Interchange to help focus the effort in planning these models. The skills and concepts necessary for developing individualized education programs for students in regular and special education classrooms are skills which can be determined by the use of these models. The experience of Project Interchange participating teachers has demonstrated this. These results can be extrapolated to predict success with a wider audience of educators with a wider range of skills.

The Archdiocese of San Francisco Department of Education brings a rich background of experiences and capabilities to the project. The following pages summarize these facts.

1. Special School Projects in Individualized Instruction

1.1 Project PLAN. The Archdiocese of San Francisco was the only non-public school system among the fourteen "developmental districts" collaborating with the American Institutes for Research (AIR) and the Westinghouse Learning Corporation in the initial development of "Project PLAN." Two pilot schools in the Archdiocese participated in the four-year development of individualized curriculum in four subject areas in grades one through eight, and have continued to adapt and utilize these individualized materials and techniques.

1.2 California Teacher Development Project (CTDP). Under a three-year ESEA Title III grant, teachers from the Archdiocese of San Francisco participated in a staff development project for individualized instruction with teachers from the following public school districts; Fremont Unified District (LEA), San Carlos Elementary District, San Jose Unified District, Santa Clara Unified District, and the Union Elementary District. Very significant positive changes of knowledge and attitudes toward individualized instruction and its support technology occurred in the study. The Archdiocese of San Francisco has continued to use and adapt the CTDP process for beginning and advanced training of teachers in individualized instruction. Currently, there are ten CTDP centers in the United States including the Archdiocese of San Francisco.

- 1.3 Hawaii English Program (HEP). Under an ESEA Title III grant the U.S. Office of Education funded "Project ALOHA," to install and adapt in six California school systems the Hawaii English Program of Individualized Reading and Language Instruction, which had been successfully developed under a previous Title III grant to the State of Hawaii. Two schools within the Archdiocese of San Francisco have participated in the project, together with schools from five public school districts: Berryessa Elementary (LEA), San Jose Unified, Santa Clara Unified, Oak Grove Elementary, and Cupertino Elementary.
- 1.4 Individualized Mastery Learning Instructional Systems (IMLIS). Two schools of the Archdiocese have participated in this ESEA Title III project for the development of individualized learning sequences and specially designed computer programs and teacher control systems for information management, as well as staff development projects utilizing educational television. Participating districts included Fremont Unified District (LEA), San Jose Unified District, and the Archdiocese of San Francisco.
- 1.5 Individually Guided Education (IGE). Two schools of the Archdiocese are participating in the Wisconsin Research and Development Center Individually Guided Education program. These schools are part of the California IGE Network and of a national network of IGE schools. The Association for Individually Guided Education is attempting to organize a national IGE Clearinghouse so that IGE schools throughout the country are made aware of resources developed by local districts and individual schools.
- 2 Teacher's Center. Adjacent to its Educational Television Center, the Archdiocese of San Francisco has established a comprehensive curriculum center for teacher planning and in-service, including commercial,

teacher-made, and student-made curriculum materials to be utilized by individual teachers or entire faculties in curriculum development and in-service. The Center typically serves over 300 teachers per month. In addition to teacher materials, model "Learning Centers" have been established for use by classes of students with their teachers to demonstrate possibilities and techniques for learning center development in schools of the Archdiocese.

3. Educational Television Center

The Educational Television Center (ETV) located in Menlo Park, California provides services to two audiences. One audience, the school community, receives class instructional programming, inservice and parent education offerings. In addition, the large Bay Area and national community benefits through experimental and developmental projects.

School Service

In serving the schools, programming and utilization assistance go hand in hand. The ETV Center maintains a library of over 3500 programs. Through screening committees, questionnaires and individual meetings with Center staff teachers have a major voice in the selection of programs. In response to teacher requests over the past several years, the ETV Center has explored new program sources and has greatly expanded its video library with a large number of excellent short series and free standing individual films.

Transmitting four T.V. channels simultaneously gives the Center tremendous scheduling flexibility. The entire school day broadcast schedule for the year is built around specific scheduling requests from individual teachers in the field.

In addition to the regular schedule of series which is published in the spring, teachers have the option of using demand or call in scheduling to request individual programs on short notice. In 1976-77 the Center dedicated 25% of its channel capacity, or one full T.V. channel to demand scheduling. In that period the Center successfully scheduled over 2500 individual programs or about 20 special requests per broadcast day. The Center's responsiveness in both program selection and scheduling reflects a concern for service to teachers. Another aspect of this concern is the tremendous emphasis placed on utilization. Two full-time staff utilization coordinators work in the field, with faculties, departments and individual teachers, developing teacher skill in using programs and providing help in integrating T.V. and other media into their curricula. To be meaningful ITV must be part of a coherent curriculum development effort. The utilization staff endeavors to develop the entire context in which T.V. is used, pre- and post-viewing activities, text correlation, physical setting, etc. In the elementary area especially the ETV Center has followed the lead provided by the Archdiocesan department of education in fostering individualized instruction with the multiple showings of a program in a given week and the possibility for demand scheduling to meet special needs, ETV has become a tool for individualization. The Center has encouraged teachers to use T.V. in small group and individual setting as well as in the standard large group, entire classroom environment.

ETV's High School Service started as a pilot effort to determine if educational T.V. in particular ITFS could be fruitfully used in the secondary school setting. Working closely with teachers and adminis-

trators the programming department developed an ongoing self-supporting service to the High School. The Center maintains a large and varied film library which is currently shared by 10 of the region's high schools. Programs are transmitted to the schools on request where they are either used in real time or taped for later replay. This electronic film delivery system has proved both popular and cost effective. Schools which have access to the same films via standard truck or electronic ITFS delivery have generally opted for the latter because of the flexibility and convenience inherent in the system.

Parent Education

To complement its classroom instructional programming the ETV Center has started special parent education programming. Programs already utilized have included a series on dental health care, one on values, and one on Parent-Teacher groups. Many of these programs have been live interactive meetings-of-the-air in which parents in their local schools were able to pose questions to experts in the studio. Future plans include:

- a live superintendant's forum
- a series on local school boards and how they function
- day time programs for mothers in the schools
- live courses on pre and post natal care

The overall intent is to involve parents in their children's education and in the policy and operations of their schools.

Inservice Training

The ETV Center has been involved in extensive inservice training for

teachers and administrators. Live workshops have been transmitted from the adjoining teacher's center, nationally produced inservice series have been transmitted, some for college credit. The superintendent of schools and general manager of the ETV Center, Msgr. Pierre du Maine has delivered bi-monthly superintendent's reports to foster greater administrative communications among widely geographically dispersed schools. In a similar vein, programming department staff have used the air waves to communicate with the ETV coordinators in each subscribing school.

4. Project Interchange

Project Interchange, using the facilities of the Educational Television Center, was funded in 1975-76 by USOE, ESEA Title III 306. The project was designed to test the feasibility of using telecommunication systems to reinforce and increase the skills of teachers who have developed a high level of expertise in individualized instruction. The project was developed by a consortium consisting of:

Torrance Unified School District; California State Facilitator Project, California State University, Chico; Santa Clara County Superintendent of Schools (the Legal Education Agency); and the Archdiocese of San Francisco Department of Education.

Teachers from Torrance, Chico and Archdiocese schools participated in an interchange of ideas based on their classroom experiences in individualized instruction and a list of their needs for further information which had been elicited from there by the project coordinators. The goals of the project were these:

System Goals are to accelerate cost/effective application of AVAILABLE electronic technologies (information/communication) to EXISTING systems of individualized instruction.

to utilize satellite interconnection to eliminate geographical and logistical obstacles to effective interaction of identified experts working toward the same "system goal."

Utilizing EXISTING system objective (for instruction and in-service)

Utilizing EXISTING personnel (teachers, administrators, support staff)

Utilizing EXISTING technologies (ITFS, cable, microwave, telephone, computer, satellite)

Project Goals

- a. To produce a change in staff ATTITUDE toward utilization of available support technologies, reducing or reversing the identified negative attitudes due to one or more of the following factors:
 - lack of experience in utilizing support technologies (e.g., ITV, computer)
 - unsatisfactory experience in utilization
 - lack of clearly defined "teacher need" or "teacher specifications" for the design of support technologies
 - assumption that support systems are not economically feasible within present constraints
 - assumption that support systems are not technically feasible in the near future.
- b. To develop staff SKILLS, through utilization of the satellite network in
 - identifying and analyzing "teacher functions" in individualized instruction
 - understanding support system capabilities
 - identifying problems which make teacher effort ineffectual or inefficient
 - developing solution strategies and "teacher specifications" for meeting identified problems in terms of available support systems

More specifically, the project used a model in which pre-broadcast materials were sent for their perusal to establish a common base of knowledge. Resource persons were available in the studio or by telecommunications to add to their information when requested. The project director and coordinator provided additional information from the studio in the form of clips, printed materials and graphics.

The evaluation of Project Interchange indicated the acceptance of teachers of the use of technological system utilizing satellite communication as a vehicle

for teacher exchange of ideas and scheme for increasing skills in a specific area of education. The teachers also reported enthusiasm for the general concept of providing opportunities for them to discuss their problems and relate their experiences to others who possessed a similarly high level of expertise in classroom practices. The general conclusion from the teacher was that further use of telecommunications for teacher training should be explored (Attachment A.)

5. Optimum Learning Environments

In the spring of 1977 a long range plan was initiated for the development of Optimal Learning Environments in the Archdiocese classrooms. This plan (Appendix 4) stated goals and objectives by which the Department staff could increasingly provide workshop and consultant support to administrators and staff, especially in their efforts to provide for the individual needs of students. The plan provides for revision of all the components of the workshop, a reorganization of the Teacher Center, a coordination of teacher training and student programming emanating from the Educational Television Center, and a coordinating of the consultant support provided by the Department of Education staff. The Plan supports the notion that teachers need more skills which will enable them to provide appropriate instruction for a wider range of student learning needs. Regular classroom teachers can become competent enough to include mildly handicapped children and high potential children in the same classroom with children of "normal" learning needs without inhibiting the progress of any student. The revision of the California Teacher Development Workshop materials and the reorganization of the Teacher Center is based on the assumption that teachers need more in-depth training in identification, diagnosis, prescription, (IEP's) evaluation and classroom management accommodate a wider range of student needs.

(See Attachment B.)

Increased capacity for in-put from resource persons and conferences among various groups of interested persons, including teachers, can come through a telecommunication capacity which provides access to these same sets of skills.

- 6.. An additional capability which is in the developmental stages is the capacity for computer services in the individual Archdiocese schools. Several schools have previously or at present have computer service. These teachers have been trained to use the computer for record keeping, student program assignments, and student learning activities. (Projects PLAN and IMLIS). The Archdiocese Department of Education is currently investigating the possibility of working with the University of San Francisco to increase computer capabilities by placing terminals in more of the schools and by providing a wider variety of programming.

The proposal, calling for increasing skills and knowledge in the provisions for exceptional children will contribute to the achievement of the long range goals of the Optimum Learning Environment Development Plans. The three service agencies of the Archdiocese Department of Education plus the increased computer capacity will contribute to the capability necessary to achieve the objectives of the proposal.

VIII. GLOSSARY

SIMPLIFIED GLOSSARY OF SPECIAL EDUCATION SATELLITE PROJECT TERMS

Archdiocese:	Educational Television Center (ETV) and the Education Department of the Archdiocese of San Francisco
CATV:	Community antenna television
CEC:	Council for Exceptional Children
CTS:	Communications Technology Satellite
DEM:	Discrepancy Evaluation Model
ETV:	Educational Television Center of the Archdiocese of San Francisco
Evaluation Component:	That portion of the Special Education Satellite Project encompassing the evaluative tasks involved. The model to be applied is the Discrepancy Evaluation Model (DEM) to be executed by the Research Foundation of the University of Kentucky under subcontract to CEC.
Exceptional:	That as classified as handicapped or gifted/talented
ITFS:	Instructional Television Fixed System
LEA:	Local Education Agency
Management Component:	That portion of the Special Education Satellite Project which sets forth and executes the long term and day-to-day management objectives of the project. To be executed by the Council for Exceptional Children
NASA/Lewis:	National Aeronautic and Space Administration/Lewis Research Center (Cleveland, Ohio)
PBS:	Public Broadcasting System
PLANET:	Planning Network, a computer conference service to be utilized as a management communications system, developed and operated by INFOMEDIA Corporation

Program Area:

The specific content within each of the portions of the Program Component:

i.e. 1. Technical Assistance Program Area, 2. Direct Services to Gifted and Talented Program Area and 3. Community Awareness/Parent Training Program Area

Program Component:

That portion of the Special Education Satellite Project (SESP) which encompasses the content goals and objectives;

i.e. that part of SESP encompassing 1) Technical Assistance, 2. Direct Services to Gifted and Talented and 3. Community Awareness/Parent Training

RCA:

Radio Corporation of America

SEA:

State Education Agency

SESP:

Special Education Satellite Project

TA:

Technical Assistance: specific help from the Special Education Satellite Project designed to meet specific identified needs of LEA personnel, increasing their management, organizational and program skills (including teaching and administration skills), and/or their available information relative to the implementation of P.L. 94-142 and Section 504 in helping exceptional children

Technical Component:

That portion of the Special Education Satellite Project which encompasses the technical goals and objectives in utilizing satellite and other appropriate telecommunications in the most effective and cost efficient manner. To be executed by the Educational Television Center of the Archdiocese of San Francisco under subcontract to CEC

UK:

University of Kentucky Research Foundation

SPECIAL EDUCATION SIMPLIFIED GLOSSARY OF SATELLITE PROJECT TELECOMMUNICATIONS TERMS

Audio:	Frequencies in the audible range or information destined for the human ear.
Bandwidth:	The frequency range of a signal or channel.
Bit Rate:	The speed at which data bits are transmitted or received; usually expressed in bits per second.
Channel:	A subportion of the radio frequency spectrum, through which a particular type of information, (audio, data, video) is passed.
Channel Capacity:	The amount of information a channel can pass per unit of time.
Communications Satellites:	Satellites whose primary purpose is communications.
Computer Conferencing:	Similar to telephone conferencing, each participant has his/her own terminal device such as a teletypewriter or CRT (cathode ray tube) computer terminal. The connecting device between the conferees is a computer. The medium, unlike the telephone conference call is text or keyboard entered information, not voice. The dialog, or information is printed out.
Data:	Information coded in the form of symbols or numbers.
Duplex:	A two-ray communications system in which communications take place between two points using separate transmit and receive channels. In such a system, information can be transmitted in two directions simultaneously.
Earth Station:	A terminal on the ground that receives and/or transmits information via satellite.
Facsimile:	A system of transmitting documents of graphic material so that the received copy is a reproduction of the original.
Frequency:	For a periodically changing electrical wave or voltage, the number of cycles per unit of time usually expressed in cycles-per-second (hertz).

Multiplexing:

Combining more than one type of signal for transmitting over a single channel.

Synchronous Equatorial Orbit:

An orbital path approximately 23,300 miles above the earth's equator. A satellite placed in this orbital path revolves around the earth once every 24 hours, always remaining over a fixed point on the earth.

Teletype (TTY):

A system of communicating alpha-numeric information in which the information is entered at the originating terminal by means of a typewriter-type keyboard, and printed out at the receiving terminal(s).

Transponder:

Signal repeater in satellite.

Video:

The information contained in a television signal.

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X. APPENDICES

APPENDIX A

Letters of Committed Interest
State Directors of Special Education;
other organizations supporting the objectives of
the Special Education Satellite Project

California: State Director, Office of Special Education
Minnesota: State Director, Office of Special Education
Virginia: State Director, Division of Special Education

Appalachian Regional Commission: Appalachian Education Satellite Program

National School Boards Association

National Association of Secondary School Principals

National Association of Elementary School Principals

National PTA

Council for Exceptional Children Federations

o Minnesota

o Virginia

Governor's Office, State of California

Gallaudet College

California State University, Chico

National Educational Association

Other Support Letters

MAR 21 1978
MAR 24 1978
WILSON RILES
Superintendent of Public Instruction
and Director of Education



STATE OF CALIFORNIA
DEPARTMENT OF EDUCATION

STATE EDUCATION BUILDING, 721 CAPITOL MALL, SACRAMENTO 95814

March 16, 1978

Mr. Rusty Welch, Project Director
Special Education Satellite Project
The Council for Exceptional Children
1920 Association Dr.
Reston, VA 22091

Dear Mr. Welch:

I am pleased to send you this letter to accompany the proposal for the National Institute of Education financial support of a project in telecommunications. I am especially pleased that several types of California communities have been selected for participation.

This office is very much interested in the application of this type of technology to critical needs in the programs for the handicapped and gifted, and our staff will be pleased to work with you in demonstrating the unique benefits of this program in improving the instruction of our exceptional children.

The special education and media persons in each of the California communities selected are extraordinarily good and can be counted on to contribute toward the success of the program.

Keep me apprised of developments.

Sincerely,

A handwritten signature in cursive script that reads "Leslie Brinegar".

Leslie Brinegar
Assistant Superintendent and
Director, Office of Special Education
916-445-4036

LB:cw



Minnesota State Department of Education
Capitol Square □ 550 Cedar Street □ St. Paul, Minnesota 55101

Phone: 296-4163

March 10, 1978

Dr. Alan Abeson
The Council for Exceptional Children
1920 Association Drive
Reston, Virginia 22091

Dear Dr. Abeson:

I appreciated the opportunity to explore with you your ideas for a proposed telecommunications project. As I indicated to you during our review, we could wholeheartedly endorse any project or system to help begin the massive process of effective communications with citizens in the educational communities of this state.

I realize that the scope of the proposed project is limited due to its pilot nature and will impact only a sampling of areas in the state. However, we need to explore ways to begin what in all likelihood is a most difficult job. Communication is always a demanding, sensitive and complex area. Unless we find ways to seek out what the people of our state and nation really want or need to know about educating children we will never gain total support or perhaps even continue to retain confidence.

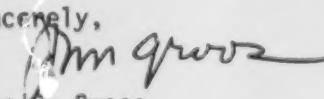
Cable T.V. is a vehicle for exploring a process that needs to happen. I am most interested in knowing whether your project can be funded, and if so, how our staff can be involved in planning with you for successful implementation in Minnesota.

Your request brings to mind an actual but sad occurrence this past week in our state. One of our largest metropolitan districts attempted to inform all parents in the district, handicapped and non-handicapped alike, of the due process safeguards underscored by the law. The district used the public media inappropriately and brought down the wrath of literally hundreds of parents on school district administrative procedures in general and on special education in particular. We simply cannot allow lack of knowledge or ineffective procedures of the past to continue to dominate the provision of public information at the end of this century.

I believe that most school administrators in our state would endorse what you hope to attempt in your project. From my own vantage point, I strongly support and encourage your effort.

Sincerely,

350


John C. Groos
Director of Special Education

JCG:ct

AN EQUAL OPPORTUNITY EMPLOYER





COMMONWEALTH of VIRGINIA

DEPARTMENT OF EDUCATION
RICHMOND, 23216

February 23, 1978

Dr. Alan Abeson
Assistant Executive Director
Evaluation, Planning and Development
The Council for Exceptional Children
1920 Association Drive
Reston, Virginia 22091

Dear Al:

This is in reply to your letter of February 16, 1978 regarding our participation in CEC's joint application with the Catholic Diocese of San Francisco in developing a proposal for submission to NIE.

As mentioned in our conversation while at the James Madison University, we have been quite interested in the application of technology in an effort to improve educational programs and related services for exceptional children in Virginia for a period of some years. In fact, about four years ago I appointed a committee of special education personnel from around the State to make recommendations in this regard. Just prior to that, an independent group (CentEx), headed by Mr. John Curtis, had also conducted an extensive survey on the Peninsula area of our State regarding the same areas of need.

Interestingly enough, both groups reached the same basic conclusions that (1) the development of a telecommunications delivery system should be based, to the extent possible, on local identified needs, (2) that the major unfulfilled educational needs presently in Virginia are appropriate services for handicapped children, and (3) that to be most effective, an educational telecommunication delivery system should be designed from the ground up, not from the sky down.

In following these independently determined common conclusions, we joined forces with CentEx in an effort to initiate on the Peninsula area an educational telecommunication system test laboratory. CentEx's research showed that the population of that area represented a microcosm of the United States. In this region, there are rural, urban and suburban school districts, private, State operated colleges, State schools and hospitals for the handicapped, a medical school, in addition to

private elementary and secondary schools and treatment facilities.

The Bureau of Education for the Handicapped has funded a project that is now in operation in this region that hopes to demonstrate the efficacy of a two-way ITFS system for the in-service training of regular teachers and administrative personnel regarding the needs of handicapped children. Other projects are now underway which will extend this system to home instruction for both parents and children, particularly those handicapped children of preschool age. Our preliminary evaluation leads us to conclude that our strategy is sound. We have now involved all the agencies of the State that have responsibility for the delivery of services to handicapped persons, and we believe that the envisioned network, when in place, can be utilized by any number of agencies. It is our intent to give first priority to the needs of handicapped children in the evolution of this system.

This background information is provided in an effort to acquaint you with our considerable efforts to develop an effective ground-based system. We are now entering the second phase which would study the feasibility of transporting a similar system, Via Satellite, for intrastate purposes, as well as serving interstate needs. It is for this reason that I believe the involvement of Virginia in your proposal would enhance its funding potential.

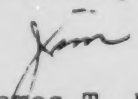
I will be pleased to write a more specific letter of support once I have a good idea of your plans for the involvement of Virginia school divisions.

While in Orlando last week, I did talk with Mr. Curtis, who was also in attendance at the same meeting. He informed me that Mr. Greene from San Francisco had called him and he was planning to return his call. I joined him and did discuss briefly with Mr. Greene our present level of involvement and relationship with Mr. Curtis' organization which can be taken over by the State at any mutually agreed upon time. It is presently to our advantage to retain this organization (CentEx) in its present posture for experimental purposes. I wanted you to know that we do have a very close working relationship with Mr. Curtis and his organization.

I look forward to hearing from you.

With kindest regards.

Sincerely yours,


James T. Micklem, Director
Division of Special Education

THE APPALACHIAN REGIONAL COMMISSION
1666 CONNECTICUT AVENUE
WASHINGTON, D.C. 20235

March 21, 1978

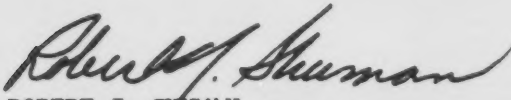
Mr. Rusty Welch, Assistant Executive
Director, Unit Development
The Council for Exceptional Children
1920 Association Drive
Reston, VA 22091

Dear Rusty:

I have received your letter of March 21, 1978, and have reviewed the same with the AESP Executive Director, Hal Morse. We concur that future cooperation and planning would be mutually beneficial to both organizations. Further, I would like to suggest a cooperative effort in developing a series workshop in the content areas we previously addressed on March 20. The AESP has developed a structure and procedure for this type of cooperation and at the earliest date possible we would like to have you attend an AESP project meeting. At these meetings, local advisory personnel assist us in need and priority assessment. I will be in contact with you on proposed meeting dates.

We look forward to working with you in the future.

Sincerely,



ROBERT J. SHUMAN
Associate Director
Appalachian Education
Satellite Program



MAR 23 1978

March 21, 1978

Thomas A. Shannon
Executive Director

Mr. Rusty Welch, Project Director
Special Education Satellite Project
The Council for Exceptional Children
1920 Association Drive
Reston, VA 22091

Dear Rusty,

We enjoyed the opportunity meeting with you and Mary McCaffrey to review our mutual concerns regarding the education of exceptional children, the formation of the informal Consortium, and NSBA's possible interest in "A Plan for Application of Communications Satellites in Education."

NSBA is interested in assisting the project staff in a productive way to provide support for CEC's effort should it be funded by the National Institute of Education. Under the program you outlined, we would be pleased to deliver assistance to school districts through our present organizational structure, and to provide consultative services to your staff in an advisory capacity. Where possible, we would certainly assist you in identifying media and materials which could be used in providing technical assistance to school districts and other audiences. It would also be NSBA's intent to pursue the feasibility of using telecommunications developed as a result of the project. Hopefully, there would be several imaginative educational applications as a result of such a joint effort.

We will look forward to joining CEC in providing our support for its efforts in this area.

Very truly yours,

A handwritten signature in dark ink, appearing to read "Tom Shannon", written over a horizontal line.

Thomas A. Shannon
Executive Director

TAS/WCM/skc

NATIONAL SCHOOL BOARDS ASSOCIATION

1055 Thomas Jefferson Street, N.W., Suite 600, Washington, D.C. 20007/(202) 337-7666



The National Association of Secondary School Principals

1904 Association Drive • Reston, Virginia 22091 • Tel: 703-860-0200

March 21, 1978

OWEN B. KIERNAN
Executive Director

Dr. Rusty Welch
Project Director
Special Education Satellite Project
The Council for Exceptional Children
1920 Association Drive
Reston, Virginia 22091

Dear Dr. Welch:

Both Deputy Executive Director Scott Thomson and I were impressed by your description of CEC's proposed telecommunications network and related projects. As indicated during our recent discussion, the NASSP representing as it does 36,000 middle, junior and senior high school principals would be pleased to play a partnership role. It would be our hope that the project would be appropriately funded by NIE and that substantial benefits would flow in the immediate future to all children and youth enrolled in the nation's schools.

As the project moves forward, I hope you will not hesitate to seek our advice, counsel and active participation.

Yours very sincerely,

A handwritten signature in dark ink, appearing to read "O. B. Kiernan", followed by a long horizontal line.

Executive Director

OBK:nwb

cc: S. Thomson



NATIONAL ASSOCIATION OF ELEMENTARY SCHOOL PRINCIPALS

1801 NORTH MOORE STREET, ARLINGTON, VIRGINIA 22209 • 703/528-6000

MAR 16 1978

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3700 North Glebe Road
Arlington, Virginia 22207

March 15, 1978

Mr. Rusty Welch, Project Director
Special Education Satellite Project
The Council for Exceptional Children
1920 Association Drive
Reston, Virginia 22091

Dear Rusty,

Thank you for your letter of March 9 advising us of your grant proposal to NIE. We are very interested in and supportive of the goals and objectives of your project.

We view the use of satellite and other telecommunications as having the potential to provide more efficient and effective instructional services for not only handicapped and gifted students, but for all students. In addition, such a delivery system could impact significantly on improving the distribution of inservice and staff development programs for teachers and administrators.

In response to your request, NAESP is very interested in continued involvement in the Consortium of Educational Associations and in assisting the project staff in the identification and development of technical assistance resources for the telecommunication network.

Your project is very worthwhile and is deserving of funding. We look forward to being actively involved in further exploring the feasibility of utilizing the telecommunications network to serve the needs and concerns of our membership related to the education of exceptional children.

Sincerely,

A. P. Caetano

Anthony P. Caetano
Executive Assistant

cc Bill Pharis

Governmental Relations

MAR 23 1978

March 22, 1978

Mr. Russell Welch, Project Director
Special Education Satellite Project
Council for Exceptional Children
1620 Association Drive
Reston, Virginia 22091

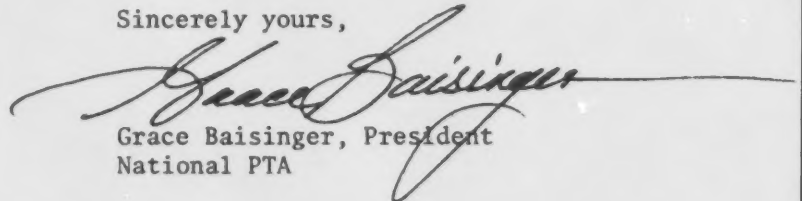
Dear Mr. Welch:

National PTA has read with great interest the Council for Exceptional Children's proposed Special Education Satellite Project, involving a four-year plan for the implementation of educational practices as required by the Education for All Handicapped Children Act (P.L. 94-142). The innovative approach to serve special populations through services delivery by means of appropriate telecommunications system is commendable.

Because of the nature of our own membership, we are particularly pleased with the description of the planned community/parent training. If your project is funded, we would like to explore with CEC ways in which local PTAs might be included in discussions of programming on handicapped issues through satellite systems. Our structure might lend itself well to what you have in mind: We have 30,000 local units (6.12 million members) in our state congresses, and an active National Board of Directors, grouped in three commissions, Education, Health and Welfare, and Individual Development.

Please keep us informed as to the status of your grant proposal. We would appreciate receiving supplementary information as to the nature of the three priority areas in the long-range plan, especially that relating to the community/parent training.

Sincerely yours,


Grace Baisinger, President
National PTA

JD/GB/gmr

UNIVERSITY OF VIRGINIA
SCHOOL OF EDUCATION — ROOM 152
CHARLOTTESVILLE, VIRGINIA 22903

SPECIAL EDUCATION DEPARTMENT

804-924-7461

March 21, 1978

Rusty Welch
1920 Association Drive
Reston, Virginia 22091

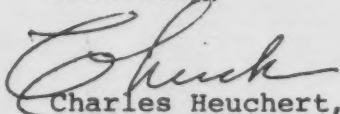
Dear Rusty,

I received your letter of March 8 telling me of the special education satellite project funded by the National Institute of Education. It sounds like an exciting adventure and the magnitude of the possibilities boggle the mind. I find myself unable to respond in a scholarly manner, because I know so little of this. I am certain that I speak on behalf of the Virginia Federation for the Council for Exceptional Children when I say that we would be highly interested in considering the opportunities for cooperative planning in the operation of the project.

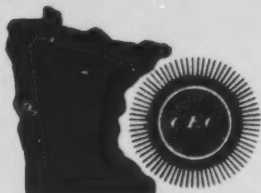
The geography of Virginia lends itself to this type of operation. The southwest area of Virginia especially is neglected because of the remoteness of the mountains and distance from the Metropolitan areas.

Thank you for your efforts in developing this program. I am looking forward to hearing about future meetings wherein we could tell of our needs and learn more of the operation.

Sincerely,



Charles Heuchert, Ph.D.
President, Virginia Federation CEC



SOUTH CENTRAL EDUCATIONAL
COOPERATIVE SERVICE UNIT
OLD MAIN—MSU
ROOM 218, BOX 9
MANKATO, MN 56001

MCEC

March 14, 1978

Rusty Welch, Project Director
Special Education Satellite Project
1920 Association Drive
Reston, Virginia 22091

Dear Rusty:

I have received your letter regarding the opportunities which exist for cooperative planning in the subsequent operation of the project funded by the National Institute of Education, in the area of using satellite and other telecommunications systems in facilitating the appropriate education of handicapped and gifted children.

The Minnesota Council for Exceptional Children (MCEC) would be very much interested in getting involved in a project of this type.

Please forward any information that we will need to co-operate with you on this matter.

Sincerely,

Les Martisko
MCEC President

LM/clk

359 - -

MINNESOTA COUNCIL FOR EXCEPTIONAL CHILDREN



State of California

GOVERNOR'S OFFICE
SACRAMENTO 95814

EDMUND G. BROWN JR.
GOVERNOR

(916) 322-7691

23 March 1978

Mr. David Green
Station Manager
Educational Television Center
Archdiocese of San Francisco
324 Middlefield Road
Menlo Park, CA 94025

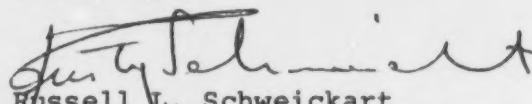
Dear David:

I appreciate the information on your work at the Educational Television Center in the use of communication satellites as an educational tool for exceptional children and those working with them. I am delighted to see the participation of seven California school districts in this exciting project. I suggest that as the plans develop the school district representatives brief their local legislators on the program and invite their participation.

As you know the Governor and I have been very interested in the experience you have developed in the use of satellite teleconferencing for educational, medical and other public service uses. In fact, it is partly from your experience that we have been able to confidently forecast wide-ranging benefits to the State from a broader use of satellite communications.

I'm delighted to see the Educational Television Center continue to play a leadership role as access to satellite communications for public service becomes more available.

Sincerely,


Russell L. Schweickart
Assistant to the Governor
for Science and Technology

RLS:pjb



THE GRADUATE SCHOOL

GALLAUDET COLLEGE

KENDALL GREEN, WASHINGTON, D.C. 20002

March 14, 1978

Dr. Alan Abeson
The Council for
Exceptional Children
1920 Association Drive
Reston, Virginia 22091

Dear Al:

Thank you for sharing the information on your proposal for satellite communication for handicapped children.

Our recent experience with a demonstration of this technology in St. Lucia in the West Indies evidenced the potential of satellite utilization. Of all handicapped children who may benefit from these technological advancements, it seems to me the deaf and hearing impaired have the most to gain. Thus, you can be assured that Gallaudet College would like very much to be involved in discussions, planning, etc. on your proposal.

Best personal regards.

Sincerely,

Gilbert L. Delgado, Ph.D.
Dean

GLD/mmmb

cc: Dr. Merrill
Dr. Watson
Dr. Nomeland
Dr. Torr
Dr. Costello
Ms. Edwards

MAR 21 1978



California State University, Chico
Chico, California 95929

Center for Regional and Continuing Education
(916) 895-6105

March 8, 1978

Mr. David Green
Department of Education
Archdiocese of San Francisco
443 Church Street
San Francisco, California 94114

Dear Mr. Green:

Royd Weintraub passed a copy of your letter of February 27 on to me for comments.

We are interested in working with you in this project. At this point in time we can identify no costs to this institution. The one eventual constraint that I see, however, is simply a matter of scheduling. We are using the ITFS delivery system for a variety of courses and four courses have been scheduled for this summer and six are already contemplated for Fall 1978. I am enclosing copies of the preliminary schedule for your information.

Incidentally, Royd asked me to check into the status of the down-converter that we sent to you. When will this be available?

Please let us know how we can be of assistance - look forward to meeting you and working with you on this exciting idea.

Sincerely,

A handwritten signature in dark ink, appearing to read "Charles F. Urbanowicz".

Charles F. Urbanowicz
Associate Dean for Regional
and Continuing Education

CFU:m1

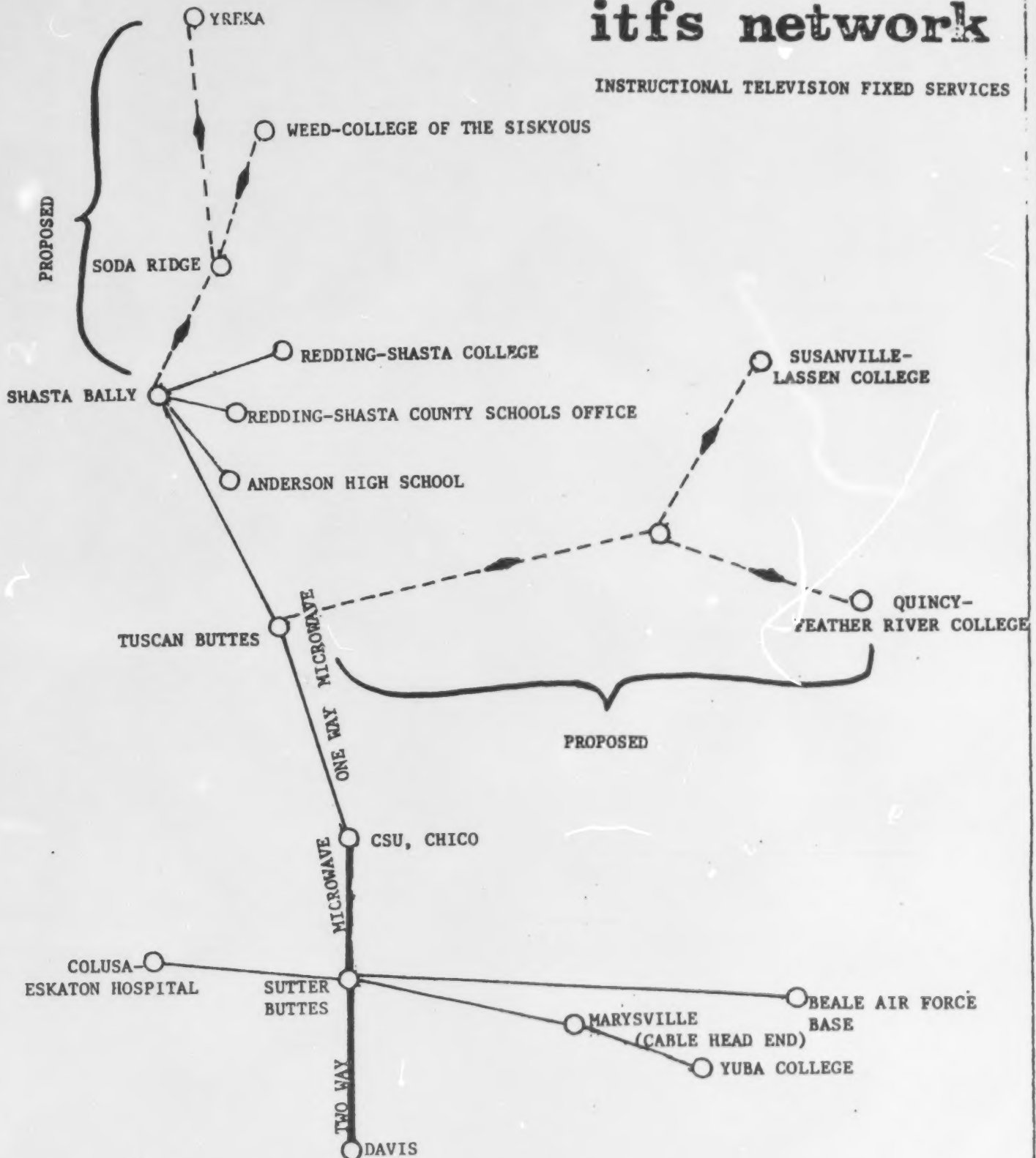
C-1996

Enclosures

cc: Royd Weintraub, IMC
Ralph Meuter, Dean for Regional
and Continuing Education

itfs network

INSTRUCTIONAL TELEVISION FIXED SERVICES



February 1978

Mar 27 1978



NATIONAL EDUCATION ASSOCIATION • 1201 16th St., N.W., Washington, D C 20036 • (202) 833-4000

JOHN RYOR, President

WILLARD H. MCGUIRE, Vice-President

JOHN T. MCGARIGAL, Secretary-Treasurer

TERRY HERNDON, Executive Director

March 23, 1978

Mr. Rusty Welch
Project Director
Special Education Satellite Project
The Council for Exceptional Children
1920 Association Drive
Reston, Virginia 22091

Dear Mr. Welch:

Thank you for your letter of March 9 and the description of the special education satellite project. The NEA is, indeed, interested in working with CEC on this program.

I believe that you already have descriptions of the materials that NEA has developed on education of the handicapped. As others are produced we will be certain that you receive them. Our role in the future work of your project should focus on how to effectively involve teachers as developers and receivers of information. To that end, I look forward to future conversations.

Sincerely,

A handwritten signature in dark ink, appearing to read "Robert McClure", is written over a horizontal line.

Robert McClure

RM:lr

cc: John Sullivan
Brenda Fox
Richard Cortright

APPENDIX B

Project Interchange - California Teacher's Conference via Satellite Reprint
Educational and Industrial Television

Project Interchange – California Teachers Conference via Satellite

An ongoing CTS experiment so geographically dispersed teachers can teleconference.

by David Green
and Bill Lazarus

MANY EDUCATORS today believe that systematically applied individualized instruction will provide a more effective and humane education for America's children, and believe further that for such individualized education to function, teachers and students must have ready access to sophisticated informational support systems for classroom management and instructional content. These educators feel that advanced broad- and narrow-band electronic communications technologies (ITV, computers, and communications satellites) eventually will provide this support.

Experience has shown that these technologies will be effective in education only when they respond to teacher needs and are subject to teacher control. Educational innovation tends to spread very slowly, if at all. Often innovative teachers are isolated within a school without access to like-minded professionals who are wrestling with similar problems; geographic distance between innovators often inhibits the spread of worthwhile innovations.

The major initial goal of Project Interchange was to use satellite technology to build communications bridges between geographically dispersed practitioners of personalized education. A second objective was to have the

Project designed and controlled by teachers and thus help generate "teacher specifications" for the future development of technological support systems. A third objective was to plan, use, and evaluate the effectiveness of teleconferencing by satellite in this context.

The Project held interactive teleconferences between teachers in the Archdiocese of San Francisco and the Torrance Unified School District in the Los Angeles area, as well as experts in the Santa Clara County Superintendent of Schools Office and resource people in the Chico State University Title III State Facilitator's Office. The Project proposed using the Canadian/American Communications Technology Satellite (CTS), and was approved by NASA in late November, 1974, becoming CTS Communication User Experiment #16.

Program Planning

There were two phases to Project Interchange. For Phase I, teacher-coordinators from the San Francisco Archdiocese and Torrance Unified School District selected "key teachers" who were interested in and experienced with personalized education. (Many other interested teachers watched the conferences and passed along their comments and questions through the key teacher in their locality.) The State Facilitator's Office acted as resource to these key teachers. The hypothesis was that, in contrast to the conventional method of circulating pre-packaged information or complete programs (whether or not they met the immediate concerns of the teachers involved), this teacher group could generate meaningful "specifications" for innovation, and that specialized resources could be marshaled to meet their articulated needs.

To plan for the satellite conferences, the key teachers, project staff in Menlo Park (headquarters of the Archdiocese of San Francisco's TV facility), evaluators, and resource people from Chico State and Santa Clara met to get to know each other and make final de-

cisions on the topics for the teleconference. Two of these were "Motivating the Passive/Reluctant Learner" and "Peer and Cross-Age Tutoring". This meeting was held in February, 1976, and one major feature of it was a simulated teleconference. The rationale for this meeting was that the conferees would hold more productive teleconferences if they knew each other (see *The Camelia Report* published by Institute for the Future, 1977).

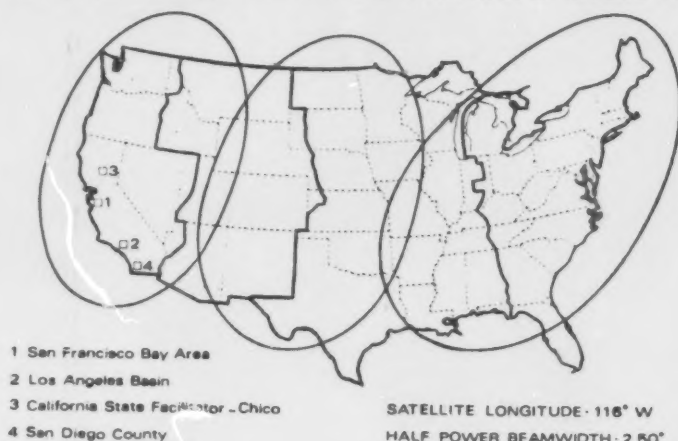
During March and April, each region held further simulations — three in San Francisco, two in Torrance, and one in Chico. The outside evaluators commented that these simulations refined the teachers' teleconferencing techniques, helping them to take hold of the project and to shape the upcoming satellite broadcasts to meet their needs. For example, the teachers learned that outside "authorities" often impeded rather than facilitated teacher interchange. Final preparations were made after data from these simulations were in.

The CTS was launched in January, 1976, was positioned and tested in February, and was in eclipse during March and April. That left only May for the teleconferences, so three full interchanges were scheduled for May 10, 14, and 19. The Project staff held planning sessions via satellite on May 17 and 24, and everybody participated in an evaluation session on May 21. The last use of the satellite in Phase I was

Project Interchange was funded in the summer of 1974 by a grant under ESEA Title III, Dissemination of Educational Innovations. The Project's Legal Education Agency was the Santa Clara County Superintendent of Schools. The Department of Education of the Archdiocese of San Francisco was accepted by NASA as the experimenter for use of the CTS, and NASA's Ames Research Center in Mountain View, California, supplied technical support. Other technical assistance came from Westinghouse Corporation, the Public Service Satellite Consortium (PSSC), and the Veterans' Administration.

David Green is the station manager and Bill Lazarus is program director of the ITFS system operated by the Archdiocese of San Francisco from its Educational Television Center in Menlo Park, California.

CTS ANTENNA BEAM FOOTPRINTS OVER U.S.



for a Project Consortium Committee meeting on May 26, 1976.

Phase II took place in the Spring of 1977. This time the focus was on special education and reintegrating the child with special learning problems into the regular classroom — a subject of interest to each classroom teacher, especially in light of Public Law 94-142 "Education for All the Handicapped Children (1975)". Because funds were limited, there were only seven participating key teachers — five in San Francisco, two in Torrance. Resource people included two from the special education staff of the Office of the San Diego County Superintendent of Schools, one from the Office of the Santa Clara County Superintendent of Schools, and a child psychiatrist from the San Francisco Institute for the Education of Neurologically Handicapped Children.

As had been the case for Phase I, after the topics were agreed upon, the project staff and resource people did the necessary research and obtained instructional materials, articles, testing instruments, visual materials, etc., so that the participants would share a common data base. The materials were mailed in advance, allowing teachers to review them before the teleconference, and an agenda was prepared.

The studio-based coordinators established a common starting point by using sections from films and videotapes to illustrate key concepts in recognizing and understanding specific learning disabilities. They then had the task of moving through the agenda without limiting discussion or spontaneity.

Technical System Design

The program originated from the studios of the Archdiocese of San Francisco

in Menlo Park — a full-color facility with two cameras, a filmchain, full switching and special effects, as well as 1" and 3/4" recording and playback capabilities.

The Archdiocese and the Torrance Unified School District both operate ITFS systems. From the Menlo Park studio, the signal was transmitted via ITFS to the NASA Ames Research facility at Moffett Field, down-converted into baseband video and audio channels, interfaced with the transmitter system, and beamed to the CTS. The satellite relayed the signal to receivers in San Francisco, Los Angeles, and Chico where it was interfaced with existing ITFS and CCTV systems and sent to the individual schools where the key teachers were located. The Project director and coordinators were in the Menlo Park studio.

The system was designed to enable the teachers, sitting in their schools, to exchange information, ask and answer questions, and even present drawings, graphs, and other visuals during the discussion. The teacher's comments were sent to the studio in Menlo Park via phone lines and were retransmitted to all participants in the network. Each teacher called a local number and these calls were then mixed, becoming one long-distance call to the studio. Several audio systems were considered, but the least expensive was the use of standard telephone lines, available through the cooperation of the telephone company.

Discussions with previous satellite users demonstrated it would be necessary to design into the system some way to overcome the delay of about 1/2 second caused by the satellite transmission. A speaker in a remote location can become confused when he hears his own delayed voice coming out of his TV set. Standard push-to-talk handsets

with a separate audio line to the TV speaker solved the problem. A teacher who wished to ask a question or make a comment would pick up the handset and push the button. This activated the mouthpiece and at the same time muted the TV speaker. When the button was released, the response was audible from the TV set.

In Phase II, San Diego was added to the network through the use of a Nippon Hoso-kykai of Japan (NHK) terminal, on loan to the Project from the Japan Broadcasting Company, at the Office of the Superintendent of Schools.

The audio frequency of the NHK terminal differs from that of the Westinghouse terminals in the rest of the network, necessitating the addition of a 4.5 mHz modulator to the Ames up-link. Initially there were some interference problems on the Westinghouse terminals (which manifested themselves as herringbones in saturated color), but transmitter adjustments minimized the difficulty. One unsolved problem, apparently inherent in the NHK receiver, was overshoot which reduced the resolution, particularly of graphics. Nevertheless, in all the NHK was stable and reliable, and the audio quality was very good.

Evaluation

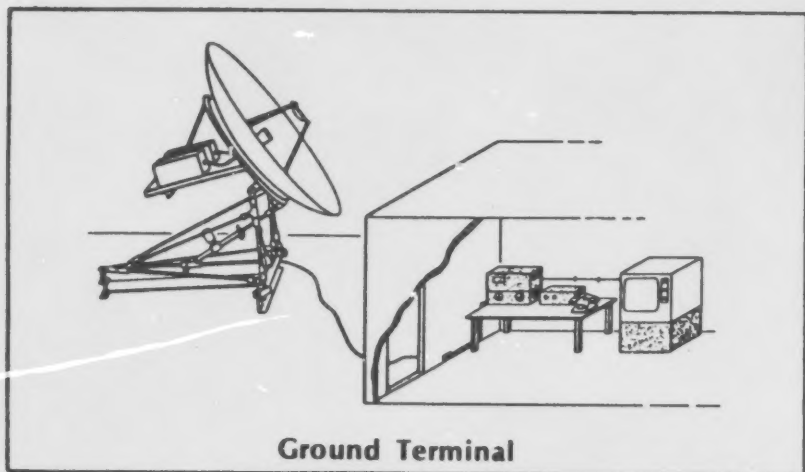
The technical system worked very well after a few initial problems were ironed out (TV sets not working, two or more teachers talking at once, etc.). The main difficulty was with the telephone land-line feedback.

Dealings with the Bell System marketing and engineering personnel were pleasant and professional. Equipment was modified on schedule and delivered to the appropriate district field office, but time and again, incorrect equipment was brought for installation or was installed, and deadlines were regularly not met.

When the correct phone equipment was in place and checked out, it proved less than satisfactory in operation. There was line noise and crosstalk which, when mixed into the system audio, tended to be cumulative from the multiple phone lines, and occasionally interfered seriously with program dialogue.

There does not seem to be a short-term solution to this problem. Other experimental users of satellites who want to share one satellite receiver with multiple, distant participants via a ground distribution system may want to consider class II satellite receivers, ITFS talkback, leased Telco lines, or other methods, despite their higher cost.

After Phase I, the teachers expressed interest in adding to the system's capability so that they could exchange fac-



Ground Terminal

similes, and participate in telephone conferences and computer conferences as well as satellite broadcasts. One of the Project Engineers developed a simple design change that would enable regional or statewide, high-quality telephone conferences. Computer conferences are also a possibility since Project Interchange is a participant in the NASA PLANET computer teleconferencing network. This could be expanded to teacher-to-teacher exchange by installing additional terminals in the participating schools.

One of the most interesting factors in the experiment was the development of the group process. Teachers maintained a very positive attitude toward the Project staff and the use of satellites, but by the end of Phase I, they made it clear that they preferred teacher-to-teacher exchanges over presentations by an expert or experts on a given topic, followed by a question-and-answer period.

The conference of Spring, 1976, moved steadily away from presentations by resource people toward a true conference among peers with periodic requests for information from the specialists in the studio or on the phone. This was certainly a healthy move for the teachers took upon themselves more responsibility for both the content and the process of the electronic meetings, and the locus of control moved from the centralized studio into the remote locations, from the specialists to the practitioners. This came about for two reasons:

1) In the second year, the teachers were sophisticated in the use of the medium and determined to make it serve their needs. 2) The Project staff was teacher-oriented and very supportive. The shift is all the more remarkable since the system, with one-way video and control of the audio both in the Menlo Park studio, might lend itself to highly centralized control.

In Phase II, more use was made of the visual element. One of the most successful segments in Phase I was a narration, accompanied by a series of slides, by a Torrance teacher concerning how he color-coded to facilitate peer and cross-age tutoring. This motivated the use of the segments from *The Puzzle Children* in Phase II.

In a followup interchange between Menlo Park and Lexington, Kentucky — part of a conference sponsored by the Bureau for the Education of the Handicapped (BEH) concerning satellites and special education — portable color equipment was used in a school to record illustrative sequences on diagnosis, prescription, and strategies for individualization. These clips were rolled in at appropriate points throughout the teleconference, enhancing the presentation by making fuller use of the visual channel. Future interchanges still continue to employ electronic field production techniques to illustrate key concepts.

During Phase I, when a teacher asked a question of someone in the studio, the screen was split and a picture of the teacher was shown on one side while the answering expert appeared on the other. For Phase II, participating teachers were rephotographed, this time in color and in more informal settings and poses. Getting rid of the "1976 Mug Shots", as they were affectionately known, was a relief to all.

Experience in Phase II underscored the importance of a closer direction of the discussion. Teachers did not call on the resource people as much as they might have, and the resource people — most of them new to the process — were not as prepared as they might have been. The in-studio staff also understood that the teachers did not want to be talked at or to have their meeting manipulated, so hesitated to adhere tightly to an agenda. Future teleconferences will attempt to strike that deli-

cate balance between openness and direction that is so critical to any successful meeting. Since teleconferencing remains a rather unexplored territory, Project Interchange's contribution in the realm of the social psychology of telecommunications may be most valuable to future users.

PROJECT STAFF, resource participants, key teachers, and the participating superintendents are optimistic that Project Interchange can obtain the funding necessary to expand and augment the project. The area of special education is of prime interest to educators at all levels — local, county, state, and federal — across the country.

One could argue that the most important element in delivering a truly "appropriate education for all handicapped children in the least restrictive environment" (per Public Law 94-142) is the role of the specialized and classroom teacher. This means there are many staff development considerations — in terms of both skills and attitudes — that must be addressed. Project Interchange staff believes that there is a role for telecommunications in general, and communications satellites in particular, to meet many of these needs.

To this end, Project Interchange staff have joined with the Special Education Department of the University of Kentucky (which recently completed a BEH contract to forecast applications of telecommunications in special education) and the Council for Exceptional Children (CEC) of Reston, Virginia (a 70,000-member association of professional personnel and others whose principal purpose is to advance the education of all exceptional children in the United States and Canada) to develop a national plan for the application of communications satellites in special education. This consortium was recently notified by the National Institute of Education that it had received funding to plan for a national three- to five-year project.

Hearing of Project Interchange's successful experience in teleconferencing, a number of CTS users have sought ETV Center support in carrying out satellite demonstrations. In the past year, we have provided engineering, coordination, and production support to the U.S. Conference of Mayors for a teleconference with Patricia Harris, Secretary of Housing and Urban Development; the National Institute on Drug Abuse; the Institute for Theological Encounter with Science and Technology; Governor Edmund (Jerry) Brown II of California, and Region IX of the Department of Health, Education and Welfare, to mention a few. □

APPENDIX C

RCA American Communications

Users Questionnaire

MAR 27 1978

RCA

Mr. Rusty Welsh
Council for
Exceptional Children
Reston, Virginia

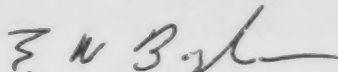
Dear Mr. Welsh:

March 24, 1978

Government Services

Here is a copy of the RCA Americom questionnaire which
Dave Green requested that we forward to you for use in
your proposal. This questionnaire has not been finalized.

Very truly yours,


E. W. Boyle

EWB/kf

attachment

RCA AMERICAN COMMUNICATIONS, INC.
GOVERNMENT SERVICES
QUESTIONNAIRE

PAGE TWO

c. WHAT IS CHARGE FOR USE OF STUDIO,
HOUR OR DAY _____

d. ARE YOU INTERESTED IN UTILIZING
YOUR FACILITY IN OFF-PEAK HOURS

YES

NO

IF YES, WHAT WOULD YOU CHARGE
FOR USE OF YOUR FACILITY

\$ _____ PER HOUR

e. WHAT COLLEGES, UNIVERSITIES, HOSPITALS, HOTELS
ARE ON YOUR SYSTEM

5. DO YOU PROVIDE ANY SPECIAL SERVICES
OR FACILITIES? IF SO, PLEASE
IDENTIFY AND PROVIDE COSTS. _____

6. COMMENTS _____

RCA AMERICOM COMMUNICATIONS, INC.
GOVERNMENT SERVICES

QUESTIONNAIRE

DATE: _____

1. FIRM NAME _____

ADDRESS _____

CITY, STATE, ZIP _____

TELEPHONE NUMBER _____

2a. GENERAL MANAGER _____

b. CHIEF ENGINEER _____

3a. CITIES SERVED BY YOUR EARTH STATION _____

b. DO YOU INTERCONNECT WITH A MICROWAVE
CARRIER OR SYSTEM TO EXTEND YOUR SERVICE YES NO

c. IF YES, WHAT IS THE CARRIER AND TO WHICH
ADDITIONAL CITIES DO YOU PROVIDE SERVICE

CARRIER _____

CITIES _____

4a. DO YOU HAVE A STUDIO FOR MEETINGS WHICH
CONTAIN VIDEO MONITORS YES NO

IF YES, ADDRESS IF NOT THE SAME AS ABOVE _____

b. WHAT IS MAXIMUM NUMBER OF PEOPLE YOU
CAN ACCOMODATE _____

PRELIMINARY

APPENDIX D

RCA American Communications
Network Map

Satellite Networks



RCA American Communications

APPENDIX F

Examples of Technical Equipment and Manufacturers

Farinon

FV4-ESR VIDEO EARTH STATION RECEIVER EQUIPMENT



A High-Quality Microwave Radio System for Use in 4-GHz Satellite Receiving Earth Terminals to Convert Incoming RF Signals into Video/Audio Outputs

- CARRIER-TO-NOISE (C/N) METERING** – Continuous metering of carrier-to-noise ratio is provided by built-in panel meter.
- TRANSPONDER CAPABILITY** – Fully synthesized local oscillator option available; remotely BCD programmable.
- APPLICATION FLEXIBILITY** – Outputs of the system may feed a microwave radio link, a CATV system, or may be used as a stand alone source for video and audio signals.
- VERSATILE PLUG-IN OPTIONS** – Equipment includes AM and FM program transmission channels, orderwire channels, clammers, remote control and monitoring equipment, FM cueing, and 4.5/5.5 MHz aural carrier generators.
- SYSTEM COMPATIBILITY** – Fully compatible with 525/625 line NTSC, PAL, SECAM and SECAM system requirements.
- EASILY MAINTAINABLE** – Mechanical design and overall size coordinate so all units are fully accessible for adjustment, testing or replacement.
- BASEBAND INTERFACE** – Options available for separate audio and video outputs for use in CARS baseband and other systems.
- FULLY FACTORY TESTED** – Installation is fast and simple.
- IF INTERFACE** – Options available for 70 MHz IF output to drive an IF heterodyne back-haul radio system.
- COMPLETE FACTORY SUPPORT** – System engineering, field service engineering and repair service are provided by experienced telecommunications engineers.

FARINON ELECTRIC, 1691 Bayport, San Carlos, CA 94070 ■ Phone: (415) 592-4120 — Tlx 34-8491

FARINON ELECTRIC OF CANADA, LTD., 657 Orly Ave., Dorval, PQ H9P 1G1 ■ Phone: (514) 633-0974 — Tlx 05-82-1893

SYSTEM DESCRIPTION

The Farinon FV4-ESR Earth Station Receiver is designed to process video format satellite transmission in the 3.7 to 4.2 GHz range.

The basic equipment consists of a high-gain parabolic antenna, a low noise amplifier, a dual conversion IF heterodyne receiver (FV4F) and a baseband conditioning shelf (FV45).

The antennas furnished with the FV4-ESR are selected on the basis of the technical requirements of each installation and on the basis of performance vs cost, ensuring the customer a quality system at minimum price. Farinon offers a choice of at least two antenna manufacturers and supplies only those antennas that have patterns on file with the FCC and meet the sidelobe requirements of Paragraph 25.209 of the FCC Rules and Regulations.

The low-noise amplifier (LNA) used in the Farinon FV4-ESR uses gallium arsenide field effect transistors to obtain the low noise figures required for quality reception. Contributions to the system noise temperature by the FV4F receiver and coaxial cabling are negligible as a result of the 50 dB of gain provided by the LNA. The actual noise temperature or noise figure of the LNA is selected by Farinon to provide carrier-to-noise ratios which conform both to customer requirements and to FCC regulations.

Figure 2 is a simplified block diagram of the terminal. As illustrated, the outputs of the system

may be used to feed a microwave radio link, an RF channel modulator or as a stand alone source for video and audio outputs.

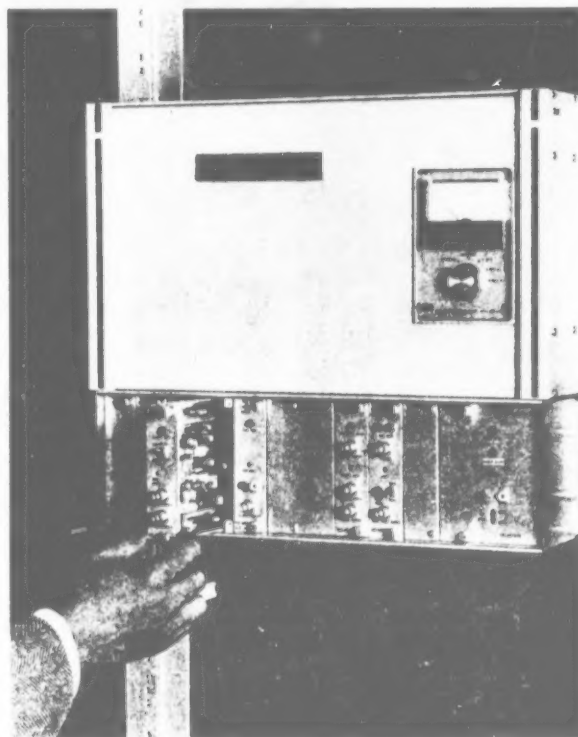


FIGURE 1. FV4-ESR Terminal. System shown includes FV4F Receiver and FV45 Baseband Shelf.

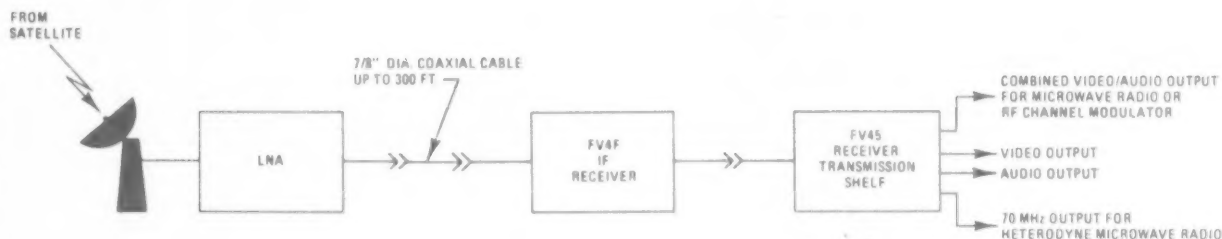


FIGURE 2. Simplified Block Diagram FV4-ESR Terminal.

FV4F IF HETERODYNE MICROWAVE RECEIVER

The FV4F microwave receiver accepts the RF input from the antenna and its low-noise amplifier, and converts the signal to a high IF and then to a 70 MHz IF. The 70 MHz intermediate frequency contains the same modulation as the incoming satellite RF. See block diagram Figure 3.

The first down-converter stage which contains a Schottky-barrier mixing diode and three combine bandpass filters, provides a broadband, low-noise output, allowing the mixer to operate at maximum conversion efficiency across the entire 3.7 to 4.2 GHz band. The three filters improve the initial receiver selectivity and provide a high degree of interport isolation.

The second mixer stage combines the high IF with the second local oscillator to produce the 70 MHz IF. The 70 MHz IF is then filtered, equalized and amplified to the output level by a variable-gain

IF amplifier that adjusts overall receiver gain by as much as 65 dB. The desired output level is maintained by an AGC loop which samples the receiver output and applies dc voltage to the variable-gain IF amplifier, continually adjusting the gain in step with variations of the RF input signal strength.

The first local oscillator is a crystal referenced phase-locked source. Both 12- and 24-frequency versions of the oscillator are optionally available. One option requires manual switching to select channel assignment; the second provides for either local or remote electronic control of channel selection, BCD programmable.

All metering, powering, and alarm functions for the receiver are centralized at a distribution/monitor unit located on the front of the receiver frame.

The receiver operating power is normally supplied by the FV45 transmission shelf.

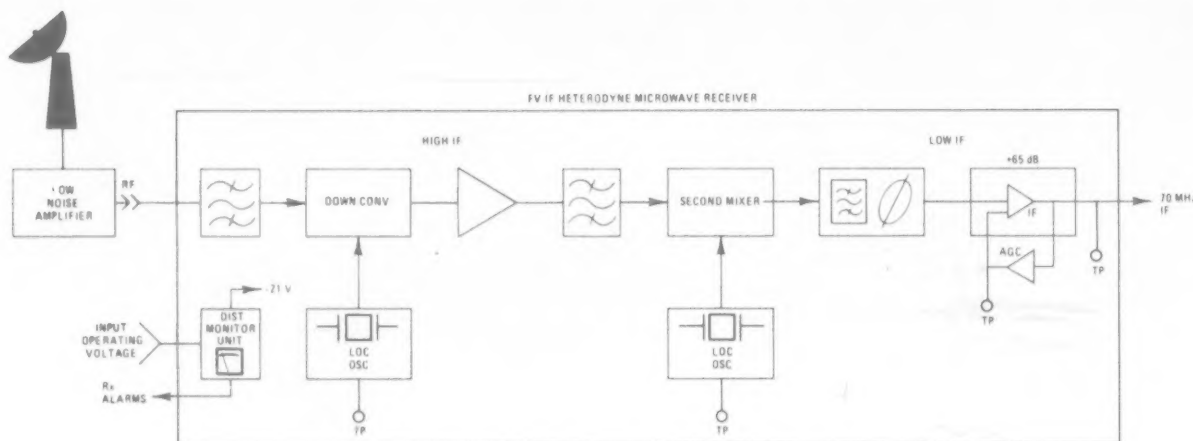


FIGURE 3. Block Diagram FV4F IF Heterodyne Microwave Receiver.

TRANSMISSION SHELVES

The uniqueness and versatility of the Farinon earth station equipment is made possible by the use of the FV45 transmission shelf assembly. Two versions of the shelf, baseband and 70-MHz arrangement, allow the demodulated output of the earth station to be used as a stand-alone source for video and audio signals, or for any of the following applications:

- Direct feed to a television channel modulator.
- Direct feed to a baseband backhaul microwave system by regeneration of a discrete subcarrier.
- Direct feed to a backhaul microwave system by generation of an internal 4.5 MHz aural carrier.
- Direct feed to a heterodyne backhaul microwave system by the regeneration of a 70 MHz IF, with appropriate subcarriers or aural carriers.

Basic elements of the system are the equipment shelves and the individual plug-in units. The shelves provide mechanical support and electrical connections. The plug-in units provide the individual circuits which can be arranged in various configurations to meet individual system needs. The shelves may operate from 115/230 Vac or -24 or -48 Vdc.

The transmission shelves also provide operating power for the companion FV4F receiver.

Block diagram Figure 5 illustrates the options available in the baseband configuration of the FV-45 transmission shelf. The 70 MHz IF from the FV4F receiver is applied to a wideband demodulator whose output is fed to both a subcarrier bus and to a video output unit. Up to 4 FM channel

receivers may be inserted into the transmission shelf, along with power, alarm and control lines. The video output unit provides level and impedance coordination, video deemphasis, low-pass filtering, and phase equalization of the demodulated video. A video squelch function is also provided in this unit.

The video signal is then fed to a clamper amplifier unit which eliminates the satellite energy dispersal waveform, removes bounce, low-frequency noise and distortion. The clamper amplifier produces two 75 ohm unbalanced outputs; one is the video output of the shelf. The second output pro-

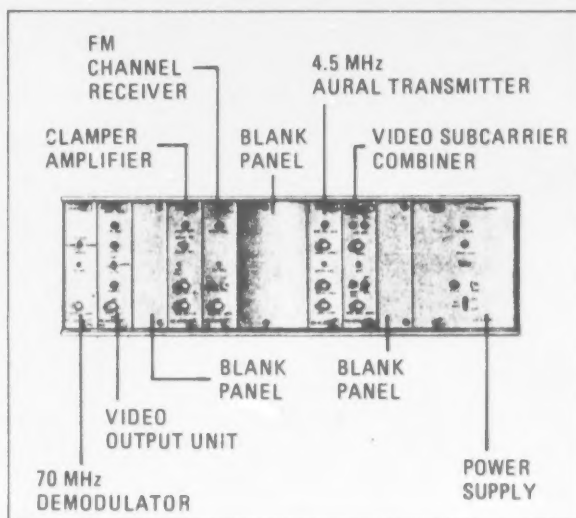


FIGURE 4. Typical FV45 Baseband Transmission Shelf.

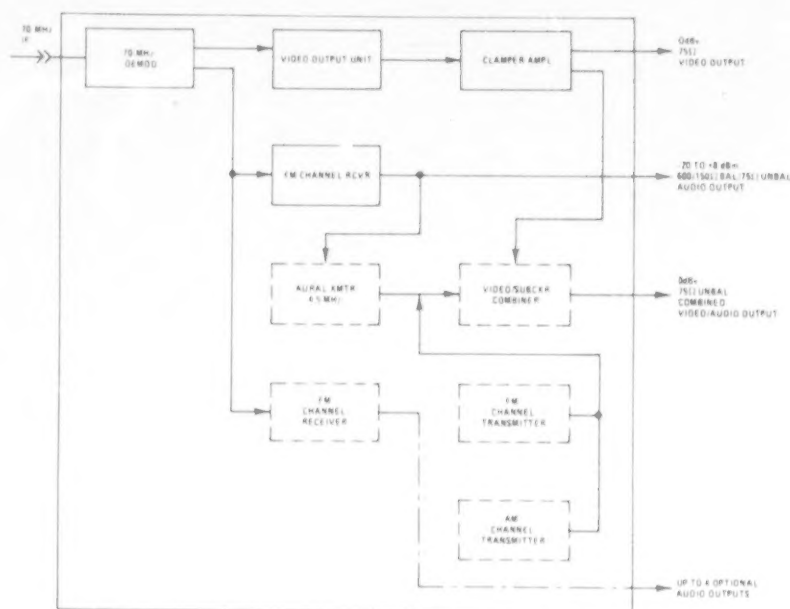


FIGURE 5. Block Diagram FV45 Receiver Baseband Transmission Shelf.

vides internal video interconnection to an optional video/subcarrier combiner which produces a combined video/audio output suitable for application to the baseband input of a backhaul microwave radio system, or a CATV modulator.

A 600 ohm balanced audio output is available for each FM channel receiver unit. A built-in bridging network allows automatic interconnection to a 4.5 MHz aural carrier generator plug-in unit upon its insertion into the equipment shelf.

Local FM and AM channels may be bridged in with the aural carrier generator output by equipping with the appropriate channel transmitter. This feature enables alarm tones, cue tones, etc. to be transmitted from the earth station site.

Figure 7 illustrates the FV45 transmission shelf when used to generate a 70 MHz signal to feed a heterodyne-type terrestrial microwave system. Most of the modular units described in Figure 4 are equipped in this version of the assembly, and their functions are as previously described. One of the 75 ohm unbalanced outputs from the clamper amplifier passes through a shelf-mounted pre-emphasis network (525-line/60 Hz or 625-line/50 Hz) to a 70 MHz modulator, which generates an output which is deviated ± 4 MHz for use with standard terrestrial microwave links. The RF output from the aural subcarrier generator (4.5 MHz illustrated) is coupled to the 70 MHz modulator assembly where it is combined with the incoming video to become the subcarrier modulating signal.

Subcarrier modulator and demodulators of various frequencies can also be equipped for either reception or transmission of control, cue or alarm signals.

Either shelf can be powered from plug-in power supplies with inputs of 115/230 Vac, -24 or -48 Vdc.

Each plug-in module is equipped for alarm functions which can be brought out as an accumulated shelf alarm, or as individual alarms with the insertion of 1 or more 60624 alarm units.

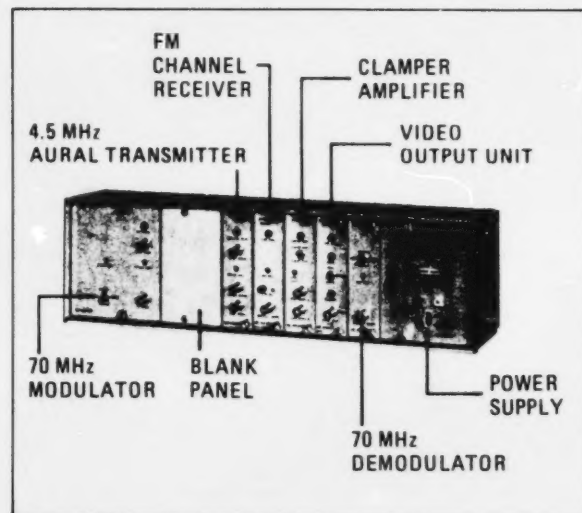


FIGURE 6. Typical FV45 70 MHz Transmission Shelf Arrangement.

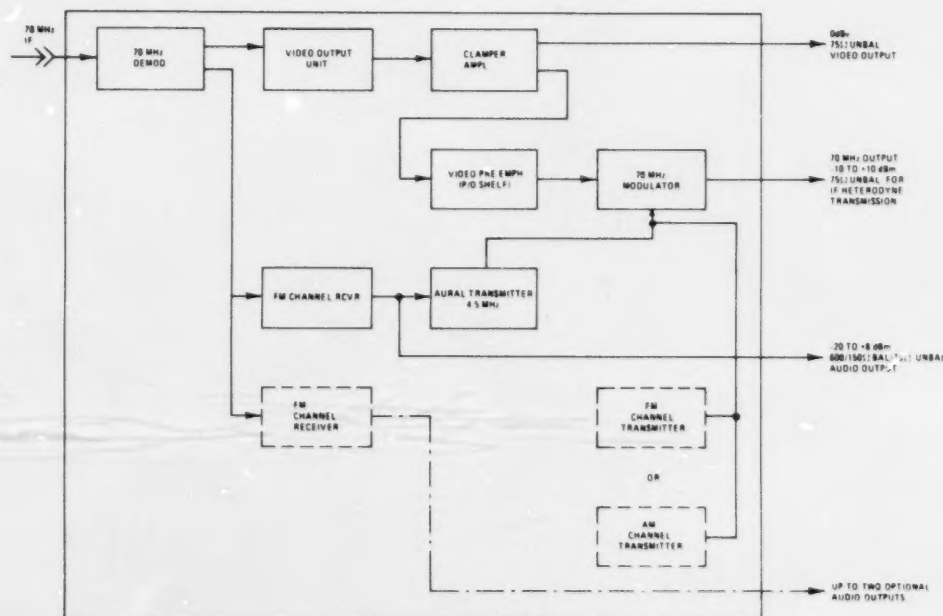


FIGURE 7. Block Diagram FV45 Receiver 70-MHz Transmission Shelf.

MECHANICAL DESCRIPTION

A number of high quality 4.5 meter parabolic reflector antennas are available with the FV4-ESR. These antennas are designed for easy assembly and erection both in remote areas and in urban sites such as parking lots, rooftops, etc. A wide variety of equipment options, including motor-driven or manually adjustable ground mounts, pressurized or non-pressurized feed systems, anti-icing systems, pointing and installation kits, etc. are available.

The low noise amplifier furnished with the system is a small modular, weatherproof unit mounted on the antenna feed horn flange.

The modular FV4F receiver frame occupies 6 rack-mounting spaces 26.7 cm (10½ in) of vertical rack space in a standard 48.25 cm (19 in) equipment rack. Three rack-mounting spaces, 13.4 cm (5¼ in) are required for each FV45 shelf. As shown in Figure 1, the FV45 shelf is usually mounted beneath the receiver. The front of the radio frame is covered with a removable snap-on panel and has a cutout for access to the distribution monitor unit. With the cover removed, radio components in the frame are exposed for testing, adjustment or replacement, see Figure 9.

All electrical connections are made at the rear of the frames (IF, RF, power alarms, etc); all front-mounted connectors are for test purposes.

Plug-in circuit modules such as the equipment of the FV45 shelves slide in and out of rails in the frames and are held in place by thumbscrews (see Figure 8). For operation and maintenance, all controls, indicator LED lamps and test points are located on the faceplates of the circuit modules.

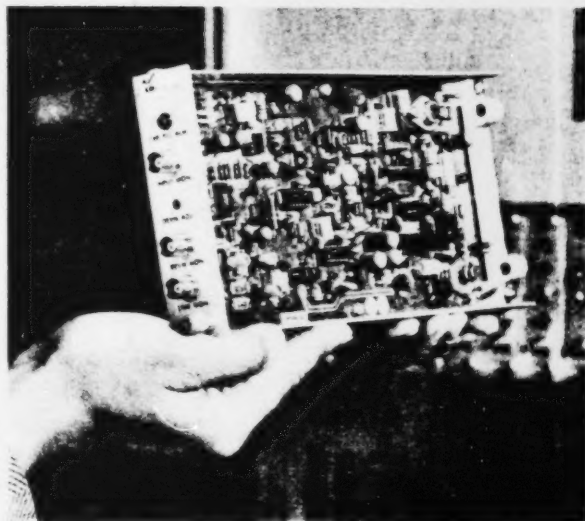


FIGURE 8. Typical Plug-in Unit for FV45 Shelf. 4.5 MHz Aural Transmitter Shown.

METERING AND ALARMS

Metering and alarm functions for the receiver are centralized at the distribution/monitor unit located at the front of the receiver frame. The distribution/monitor unit is fully self-contained and has its own meter panel and visual alarm indicators.

The meter and alarm functions for the receiver are:

Receiver Metering

- Carrier-to-noise ratio
- AGC current
- Down converter local oscillator drive
- First mixer local oscillator phase-lock voltage
- -21 volt receiver frame input voltage
- External current measurements (100 microamps, max.)
- External voltage measurements (30 volts, max.)

Receiver Alarms

1. Receiver Threshold alarm (alarm indication if received RF signal level drops to the receiver's operational threshold point).
2. First Local Oscillator Phase Lock alarm.

These alarms are consolidated into a summary alarm which provides a form C relay closure for customer alarm equipment, or can be transmitted on backhaul microwave radio by the use of optional alarm relay units and appropriate FM channel transmission units.

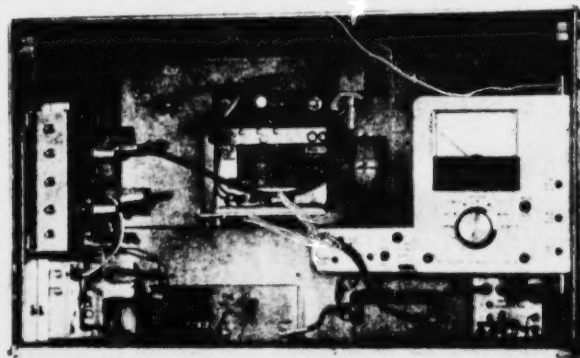


FIGURE 9. Inside View of FV4-F Receiver Frame.

SPECIFICATIONS

Down Converter Characteristics

Type	Dual Conversion
Tunability	Up to 12 channels — local/ remote switchable or Up to 12 channels — mechanically tuned or Single channel — Xtal change for channel select
RF Input	3700 — 4200 MHz
Frequency Range	500 MHz
Level	-30 to -79 dBm
Noise Figure	10 dB max.
Signals	FM TV carriers
Impedance	50 ohms, coaxial
Return Loss	22 dB
Frequency Stability (local oscillators)	±0.003%
IF Output	
Frequency	70 MHz
Bandwidth	30 MHz, 40 MHz optional
Impedance	75Ω unbalanced
Level	+1 dBm to -7 dBm, -1 dBm nominal

Video Performance

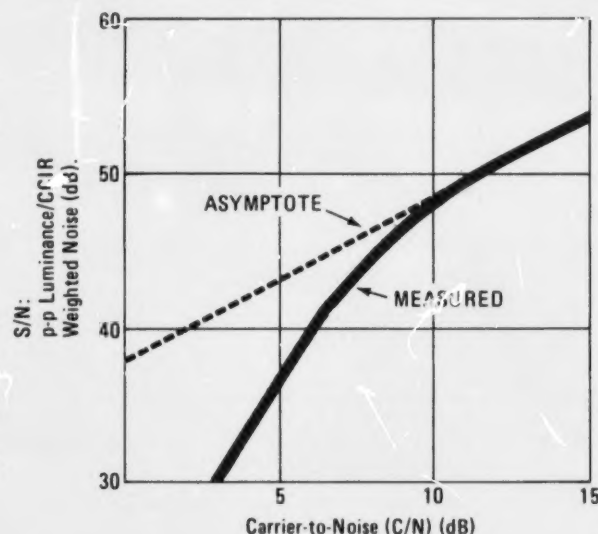
	North American 525-Line Service (NTSC)	International 625-Line Service (PAL/SECAM)
Video Output Level	0 dBv, 75 ohms	0 dBv, 75 ohms
Frequency Response		
10 kHz to 4.2 MHz	0.4 dB p-p	
10 kHz to 5.0 MHz		0.5 dB p-p
Line-Time Distortion	1.4 IRE p-p	±0.7%
Field-Time Distortion	2 IRE p-p	±1%
T-Bar Ringing	4 IRE p-p	
2T Pulse Response		
Pulse-to-Bar Ratio	±1 IRE	±1%
Ringing	2 IRE p-p	2%
12.5T Pulse Response		
Max. Relative Chrominance Level (RCL)	±1 IRE	
Max. Relative Chrominance Delay (RCD)	±20 ns	
20T Pulse Response		
Max. Relative Chrominance Level (RCL)		±1%
Max. Relative Chrominance Delay (RCD)		±20 ns
Differential Gain 10 to 90% APL	±2%	±2%
Differential Phase 10 to 90% APL	±0.5°	±0.5°
Signal-to-Hum Ratio (unclamped) (p-p luminance signal to p-p hum, dc to 10 kHz)*	50 dB	50 dB

*Excluding the effects of the satellite energy dispersion signal

Video Performance

continued

Video S/N	See graph
Clamper rejection of energy dispersion waveform	>36 dB >36 dB



FM Audio (Program) Channel Performance

Frequency Response	1 dB p-p, 40 Hz to 15 kHz
Harmonic Distortion (at rated max. modulation)	1% at +18 dBm channel output level
Signal-to-Noise Ratio (rms test tone at rated max. modulation/rms noise with 75 μs emphasis)	60 dB typical
Level	+8 dBm nominal, 600/150 ohms, balanced or 75 ohms, unbalanced

Prime Power Requirements

Operating Voltages	-21 Vdc, regulated ±0.5% -24 Vdc, nominal (-22 to -28 Vdc range) or -48 Vdc, nominal (-44 to -56 Vdc range) or 115/230 Vac (105 to 125 Vac or 210 to 250 Vac ranges), 50-60 Hz, single phase
Power Consumption	130 watts max.

Data subject to change without notice

FV41 FM TRANSMISSION CHANNEL SYSTEM

For program audio, FM stereo, voice-frequency multiplex, wideband data, express order-wire or other auxiliary transmission above video

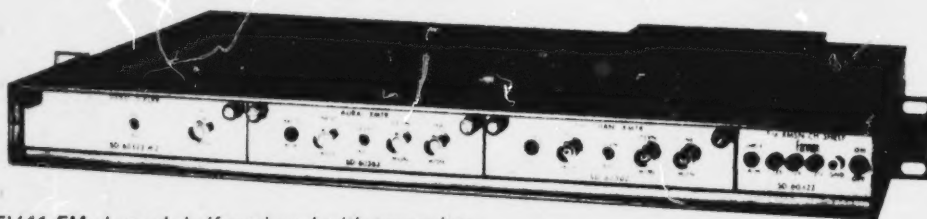


Figure 1. FV41 FM channel shelf equipped with transmitter, and diplexer units.

- Applicable to microwave or to cable
- Optional 15kHz or 100kHz bandwidth
- Subcarrier frequencies in full spectrum coordination with video signal and radio pilots
- Interfaces with all standard video line configurations
- Requires only one rack-mounting space for two channels
- Meets FCC, CCIR, EIA, network and Bell System requirements.

Farinon FV41 FM transmission equipment adds one or two low-noise, low-distortion, flat-response, 15kHz or 100kHz channels to the baseband spectrum of a microwave radio path or to a video cable system. These channels are positioned immediately above the frequency band occupied by the video channel and are almost completely transparent to the simultaneous video signals.

FM subcarriers may be selected from several standard channel frequency plans.

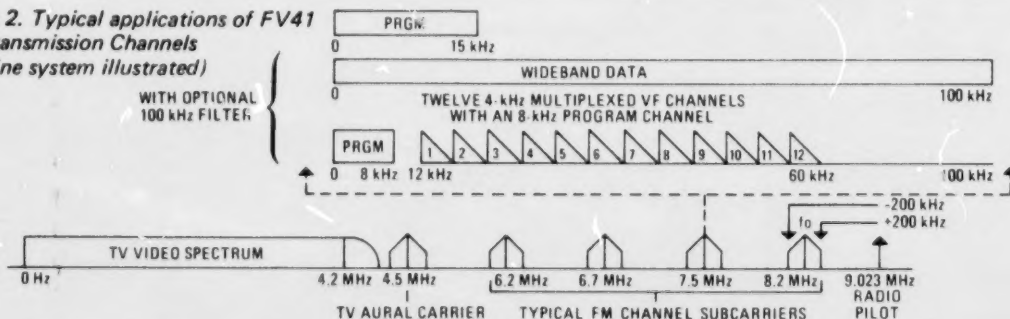
When equipped for an aural (TV sound) signal transmission function, FV41 system components provide a uni-directional, transmit-only terminal for one FM aural channel and may, additionally, furnish a single, uni-directional, two-terminal voice

and/or tone service channel. The exceptionally frequency-stable (± 200 Hz) subcarrier for the aural channel is limited to transmission at 4.5 MHz (the TV broadcast sound subcarrier frequency).

The transmitter features tamper-proof automatic frequency control; the receiver is equipped with automatic squelch. Carrier-failure alarm is extendable for remote monitoring. Linear integrated circuitry and modular mechanical design assure trouble-free operation and ease of maintenance.

The receiver may be equipped with an optional 100kHz filter where the channel will be used for wideband data, VF multiplex, or other broadband applications.

Figure 2. Typical applications of FV41 FM Transmission Channels (525-line system illustrated)



EQUIPMENT ARRANGEMENT

Each FV41 system consists of two end terminals and may include one or more "drop-and-insert" intermediate points. Each transmission channel is established by a wide-band, high-deviation, stable FM transmitter with a matching receiver at the opposite terminal. Transmitters,

receivers and video duplexers are plug-in units in the terminal shelf. Shelves are wired and designated for transmit-only, receive-only or drop-and-insert operation. Duplex transmission requires a separate shelf at each location for each direction of transmission.

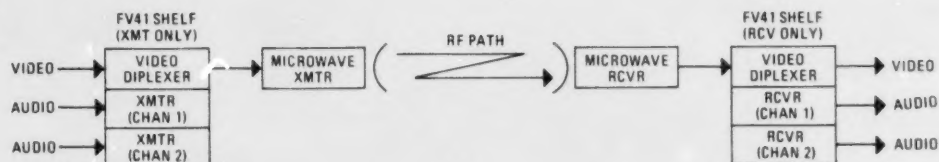


Figure 3a. One-way, two-channel transmission terminals.

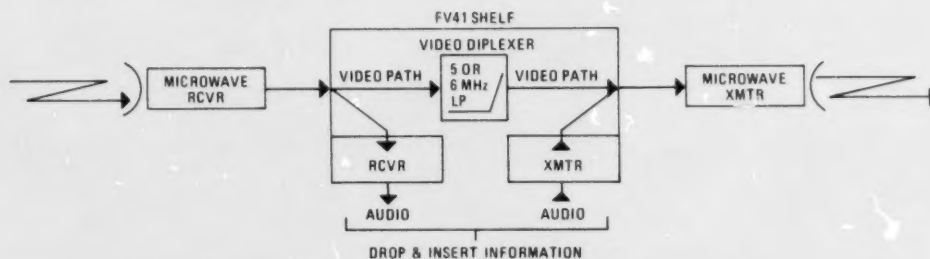


Figure 3b. One-way, channel drop-and-insert terminal.

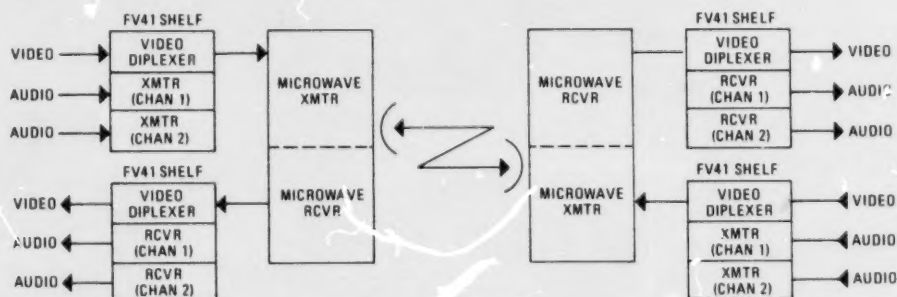


Figure 3c. Duplex transmission.

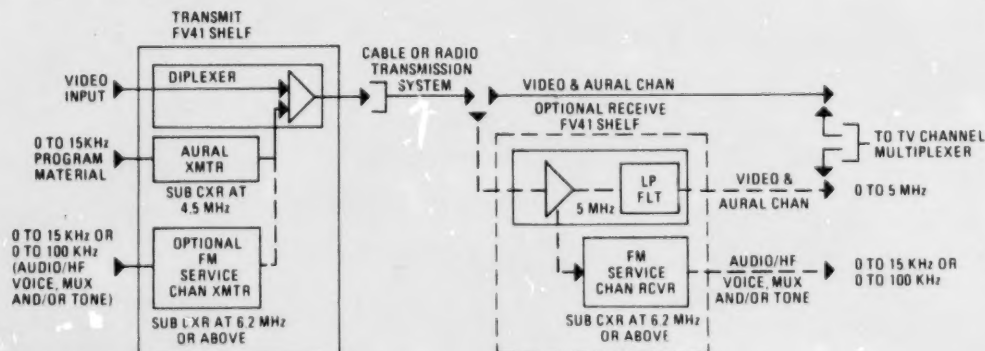


Figure 3d. 4.5-MHz aural transmission

FM CHANNEL TRANSMITTER

A program or wideband signal is applied to the FM channel transmitter via the audio input connectors of the channel shelf. In the transmitter, the audio signal is amplified and modulates the transmitter's FM oscillator. The modulated oscillator signal, or subcarrier, then is filtered to reject oscillator harmonics and amplified to the required output level. The diplexer then bridges this subcarrier (and a subcarrier from a second channel if two channels are used) onto the combined baseband with the outbound video signal.

Supporting circuits in the FM transmitter provide automatic frequency control, carrier-failure detection and associated alarm control.

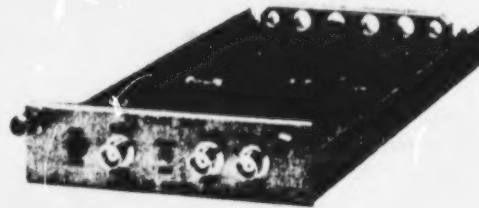


Figure 5. FM Channel Transmitter.

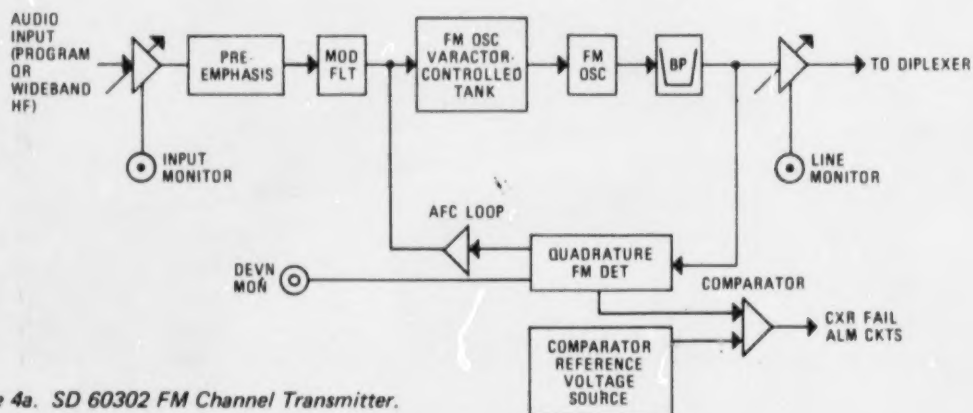


Figure 4a. SD 60302 FM Channel Transmitter.

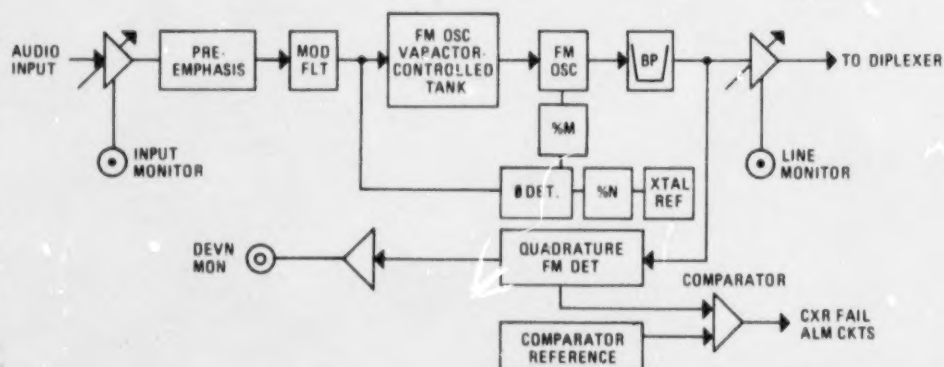


Figure 4b. SD 60363 Aural Transmitter.

FM CHANNEL RECEIVER

After broadband signal amplification at the receiver input, a bandpass filter rejects the video portion of the baseband spectrum and all but one selected FM channel subcarrier. This signal is demodulated and the resulting audio signal is amplified and matched to the output line.

Carrier-failure detection and alarm facilities are provided within the receiver, and an automatic squelch circuit mutes the audio output if the received signal level drops below usable limits.

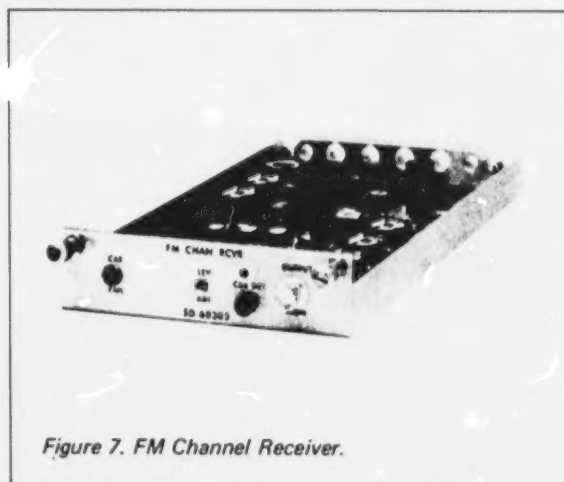


Figure 7. FM Channel Receiver.

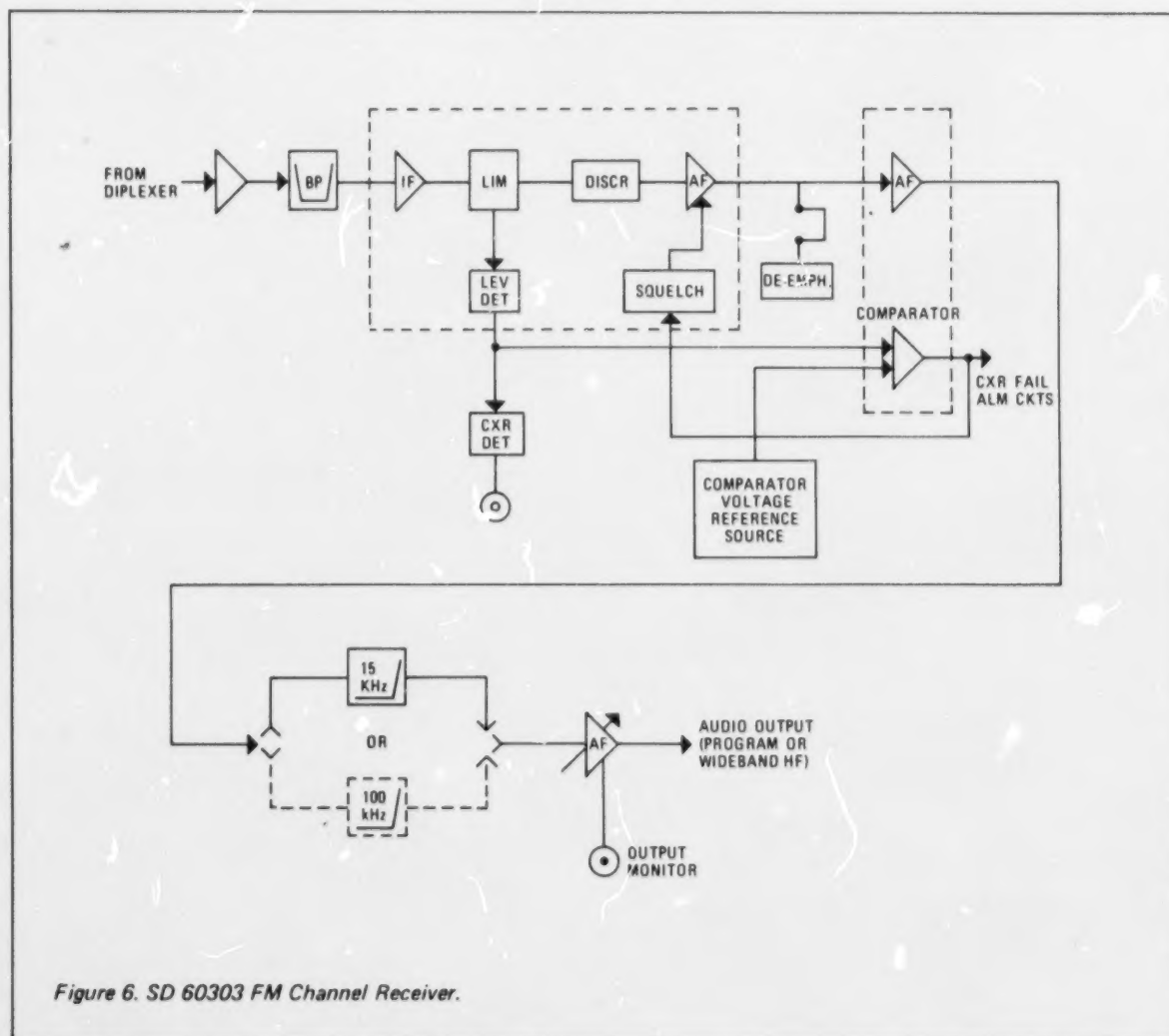


Figure 6. SD 60303 FM Channel Receiver.

VIDEO DIPLEXER

The heart of each FV41 terminal is the SD-60323 video diplexer with its phase-equalized, amplitude-equalized, low-pass filter, which is transparent to the video components below 4.2, 5, or 6 MHz and provides at least 30 dB of attenuation at the transmission channel subcarrier frequencies.

Figure 8a shows the diplexer in the receive mode. Composite video and FV41 transmission channels entering the terminal shelf are fed to the diplexer's input amplifier. The low-pass filter blocks the FV41 subcarriers, which become the input into the FV41 receivers. The video signal passed by the low-pass filter is then treated by the delay and amplitude equalizers to correct any distortion caused by the filter, is amplified, and

is then applied to the video line leaving the shelf.

In the transmitting mode (Figure 8b), the subcarrier from an FV41 transmitter is diplexed onto the video path just ahead of the output amplifier. In this mode, the diplexer's low-pass filter and equalizers ensure a noise-free spectrum for transmission of these subcarriers.

For a drop-and-insert location, the diplexer will drop one channel and will insert one channel, both in the same direction.

The diplexer interfaces with all standard video line configurations. Input and output levels are the standard 0 dBv. Complete specifications are in the performance data on page 6.

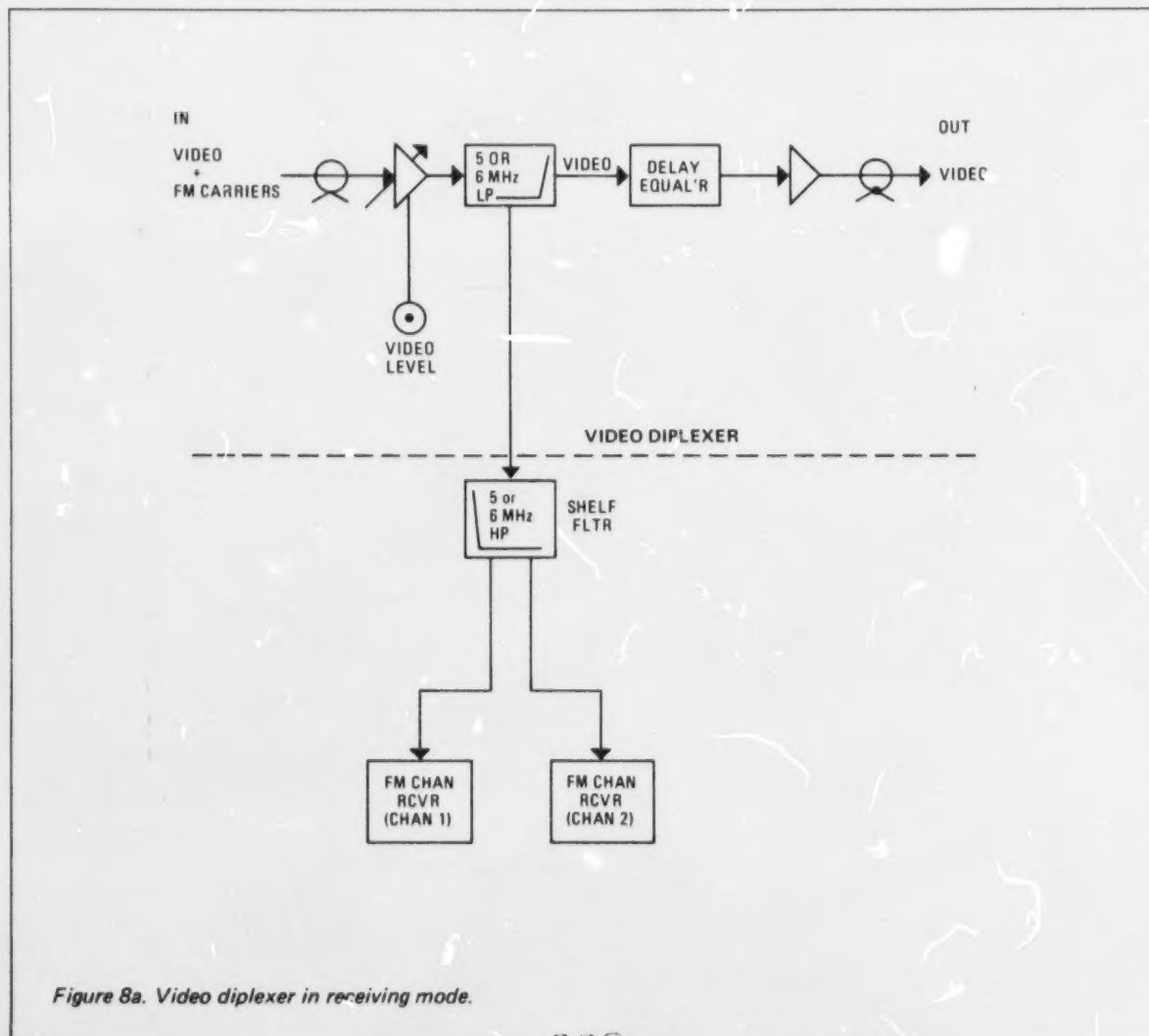


Figure 8a. Video diplexer in receiving mode.

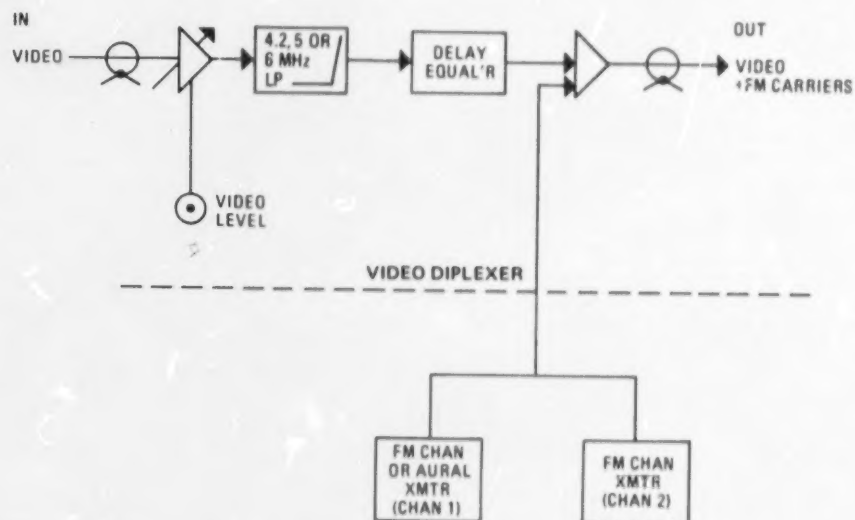


Figure 8i. Video diplexer in transmitting mode.

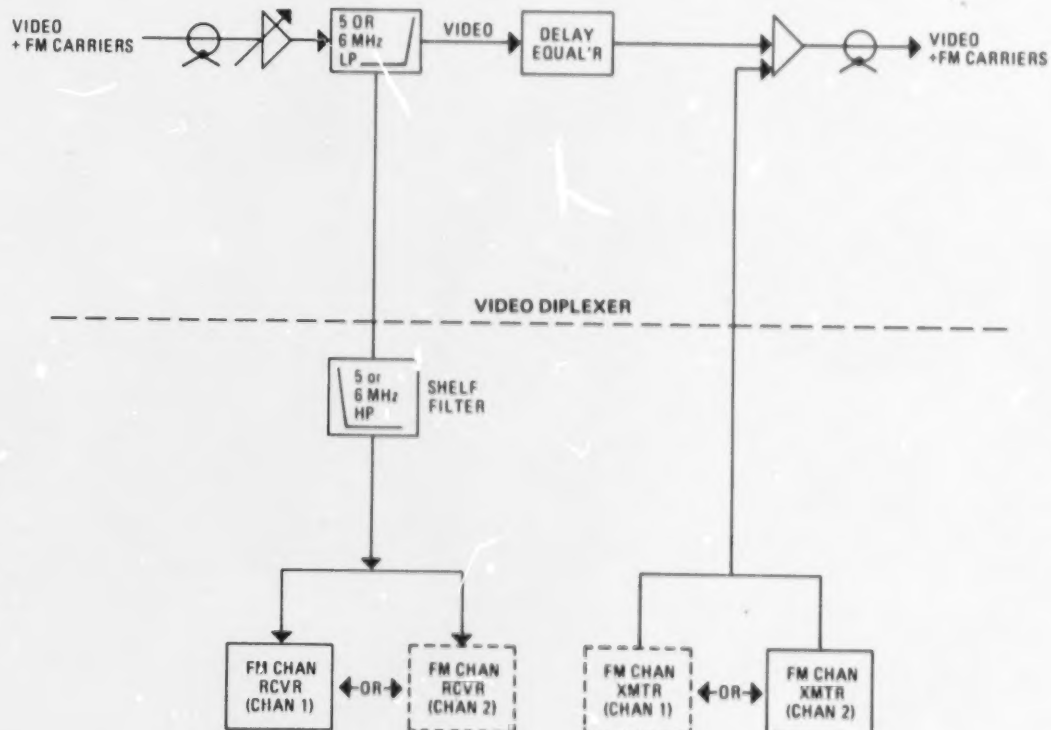


Figure 8c. Video diplexer in drop-and-insert mode.

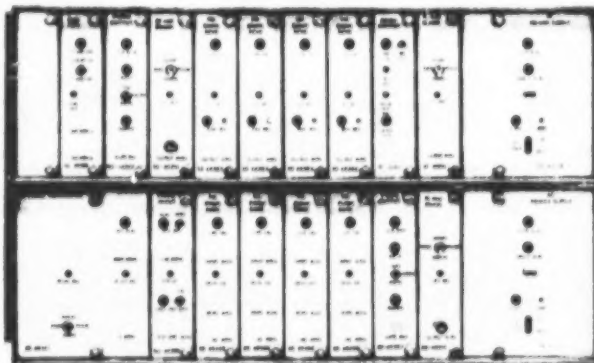
POWER, ALARM AND TEST FACILITIES

The terminal shelf contains two separate power supplies which provide three separate, fully-regulated dc output voltages to operate the transmission channel equipment. In addition, each FV41 transmitter has a ripple filter to ensure maximum stability.

The carrier-failure alarms of the channel transmitters and of the channel receivers are consoli-

dated, within the shelf, with a power fuse alarm. Dry contacts, controlled by this shelf circuitry, provide an office alarm indication.

Test points are provided at all important circuit locations within the FV41 equipment. These facilities, coupled with a minimum of conveniently-located controls, make system alignment simple and rapid.



Similar transmission channels also are available in the FV40 Transmission Equipment Shelves. Ask for Data Sheet 7430.

Ask Farinon representatives about the FV series of microwave systems for video transmission in the 2, 4, 6, 11 and 13 GHz bands; fixed and portable, frequency-agile, microwave repeaters; RF repeaters for video transmission; the FV-40 video terminal equipment; and a broad range of transmission systems and accessories.

PERFORMANCE CHARACTERISTICS FV41 FM TRANSMISSION CHANNEL SYSTEM

Channel Subcarrier Frequencies:

4.83 MHz, 5.14 MHz, 5.79 MHz, & 6.2 MHz
6.2 MHz, 6.7 MHz, 7.5 MHz, & 8.2 MHz
6.17 MHz, 6.8 MHz, 7.67 MHz, & 8.3 MHz
7.02 MHz, 7.5 MHz, 8.065 MHz, & 8.590 MHz
and 4.5 MHz Aural Carrier Generator.
Other frequencies available on special order

Video Line Input & Output Impedance:

75 Ω unbal, or 75 Ω or 124 Ω bal.

Video Line Input & Output Levels:

0 dBv nominal (-3 to +2 dB adj. range)

Video Input Hum Rejection:

> 60 dB 60 Hz
> 40 dB to 5.5 MHz

FM Chan Audio Input & Output Impedance:

75 Ω unbal, or 150 Ω or 600 Ω bal. (Xmtr also has high imped. input)

FM Chan Audio Input Levels:

Program -20 to +8 Vu(+21 dBm peak), WB Data -20 to 0 dBm, VF Mux -40 to 0 dBm (test tone)

FM Chan Audio Output Levels:

Program -20 to +8 Vu(+21 dBm peak), WB Data 0 to +15 dBm, VF Mux -20 to 0 dBm (test tone)
Optional Audio Emphasis is 75 μ s (strap option)

4.5 MHz Aural Carrier Generator Level:

Adjustable, -35 to +12 dBm 75 Ω

External Connections:

Video-line Input & Output, Audio, Power, and Office Alarm appear on connectors and a terminal block at the rear of the shelf. A mating, cable-end connector kit is furnished for use with the shelf.

Dimensions:

The terminal shelf mounts in one rack space on a standard 19-inch equipment rack. Shelf projects forward 5 inches from face of rack. Shelf overall depth is 14 inches.

Ambient Operating Temperature Range:

0 to +50 $^{\circ}$ C (+32 to +122 $^{\circ}$ F)

Power Source and Requirements:

-24 or -48 Vdc, or 115 Vac or 230 Vac, 50/60 Hz
25 watts maximum per terminal shelf.

FM Channel Performance: Per Back-to-Back Terminal Pair

PARAMETER	MEASUREMENT	VALUE
Frequency Response	40 Hz to 15 kHz 40 Hz to 100 kHz	1 dB p-p 1 dB p-p
Signal-to-Noise Ratio	Back-to-back Xmtr/Rcvr Via Typical Microwave Hop	> 70 dB > 65 dB
Program Channel Harmonic Distortion	at +21 dBm (peak output) at +8 dBm	< 1% < 0.25%
AM Rejection		40 dB
Subcarrier Frequency Stability	0 to +50°C	± 10 kHz
Program Channel Group Delay (reference: 1 kHz)	40 Hz 100 Hz 5 kHz 10 kHz 15 kHz	10 ms 1 ms 10μs 30μs 1 ms

FM Channel Performance: 4.5 MHz Aural Carrier Generator

PARAMETER	MEASUREMENT	VALUE
Frequency Response	40 Hz to 15 kHz	1 dB p-p
Deviation Non-Linearity	25 kHz Peak Deviation	1%
Subcarrier Frequency Stability	0 to 50°C	±200 Hz

Video Performance: Per Back-to-Back Terminal Pair

PARAMETER	MEASUREMENT	VALUE
Amplitude Response	dc to 4.2 or 4.5 or 5.5 MHz	0.25 dB p-p
Short Time Waveform Distortion (SD)	2T Pulse to Bar AMPL 2T Pulse Peak to Peak Ringing	±1% (+2% 4.2 MHz filter) 1% (2% 4.2 MHz filter)
Line Time Waveform Distortion (LD)	Bar AMPL	0.25%
Field Time Waveform Distortion (FD)	60 Hz Square Wave	0.5%
Long Time Wave Form Distortion (Bounce)	10 to 90% APL	1%
Group Delay	dc to 4.5 or 5.5 MHz	40 ns max
Relative Chrominance Delay (RCD)	12.5T or 20T Pulse	±20 ns
Relative Chrominance Level (RCL)	12.5T or 20T Pulse	±0.5%
Differential Phase	10 to 90% APL 3.3 or 4.43 MHz	<0.3°
Differential Gain	10 to 90% APL 3.58 or 4.43 MHz	<0.3%
Luminance Signal-to-Noise Ratio	dc to 10 KHz 10 KHz to 4.2 MHz Weighted	60 dB p-p LUM/RMS Noise 70 dB p-p LUM/RMS Noise

Farinon

Farinon Electric, 1691 Bayport, San Carlos, CA 94070 • Phone: 415/592-4120 • Tlx 34-8491

Farinon Electric of Canada, Ltd., 657 Orly Ave., Dorval, PQ H9P 1G1 • Phone: 514/636-0974 • Tlx 05-82-1893

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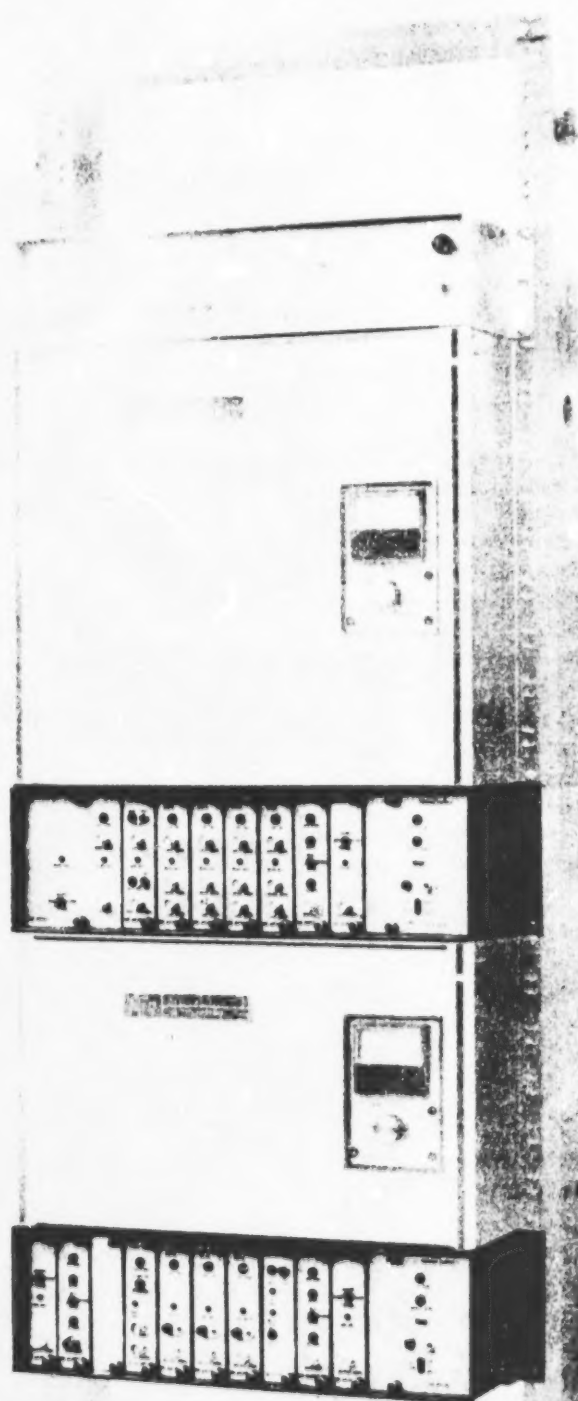
FV40 VIDEO TRANSMISSION EQUIPMENT for microwave relay or cable systems

Plug-in video terminal equipment units for flexible baseband and heterodyne system arrangements

- video impedance and level coordination
- 70-MHz modulation and demodulation
- sub-carrier channels for program audio
- orderwire and alarm sub-carrier transmission channels
- clamper amplifiers
- radio system noise and continuity pilot monitors

with unit options for 525-line NTSC, or 625-line operation with PAL, PAL-M or SECAM color systems.

Figure 1: Farinon FV13F IF Heterodyne Microwave Radio terminal; power supply and transmitter above, receiver below (all shown shaded), with corresponding FV40 Video Transmission Equipment shelves.



THE SYSTEM

Farinon FV40 Video Transmission Equipment offers a convenient and flexible method of providing video input/output functions and of adding auxiliary functions to IF heterodyne or baseband radio relay and cable video systems.

The FV40 system may be applied to Farinon microwave radio systems as ordered from the factory, or may be added to standard-interface radio or cable systems of any manufacture. All FV40 equipment interfaces with conventional line connections:

Basic elements of the system are the equipment shelves and the individual plug-in functional units. The shelves provide mechanical support and electrical connections; the plug-in units provide the individual circuits and may be added in arrangements or combinations to meet individual needs. Shelves and plug-in units may operate from 115/220 Vac or from -24, -48 or -21 Vdc.

Equipment reliability is emphasized throughout, with solid mechanical design, conservative use of proven circuit components and generous provision of test points, alarms and back-up functions.

Block diagrams of typical heterodyne and typical baseband repeater systems are shown in Figure 2. FV40 shelves with installed units for a baseband radio system are shown in Figures 3 and 4.

FUNCTIONAL UNITS

Video input and output units: — provide level and impedance coordination, video emphasis,* video presence detection and alarm, and phase-equalized low-pass filters.* The input unit also provides a 1-volt p-p line-up oscillator and continuity pilot.* The output unit provides for video squelch.

70-MHz Modulators and Demodulators: — stable, wide-band, low distortion modems. The modulator is phase-locked to a crystal.

Audio subcarrier channels: — high performance and flexible FM audio channels for program transmission above video, with frequency options for U.S., Canadian and CCIR applications, and integral impedance and emphasis options. Channels may also be utilized for frequency-division multiplexed voice or data transmission.

Orderwire channels: — fully synchronous AM channels for party-line orderwire, alarm and control and general administrative transmissions on heterodyne or baseband repeated systems. Audio drop and insert shelf is available.

Clamper Amplifiers: — modern, gated-feedback clampers removing low-frequency noise and distortion, with continuously variable 0-15 dB gain and strap-selectable balanced or unbalanced input and output.

Message-Service Interface Units: — with message emphasis for up to 1800 voice channels.* Interfaces

with voice and data multiplex for emergency message restoration, parallel-path message/video routing, etc.

Radio system monitors: — monitor continuity pilot* and quantitative system noise, and generates alarms.

Power supplies: — optional 115/220 Vac, -24 Vdc or -48 Vdc. Each supply will power a complete transmit or receive shelf.

AVAILABLE AS PLUG-IN OR ASSOCIATED UNITS FOR THE FV-40

60300	Video Input Unit
60301	70-MHz Modulator
60302	FM Channel Transmit Unit
60303	FM Channel Receiver Unit
60304	AM Channel Transmit Unit
60305	AM Channel Receiver Unit
60307	Video Output Unit
60308	Clamper Amplifier
60313	System Monitor (Pilot & Noise)
60314	70-MHz Demodulator
60316	-48 Vdc Converter Unit
60317	-24 Vdc Regulator Unit
60318	115/220 Vac Power Supply
60349	Alarm Unit
60363	4.5 MHz Aural Carrier Generator
60536	Msg. Input Unit
60537	Msg. Amplifier
60563	Video/Subcar. Separator
60564	Video/Subcar. Combiner
60333	Extender Unit (for testing)
60310	Video Noise Test Set
60384	Deviation Test Unit

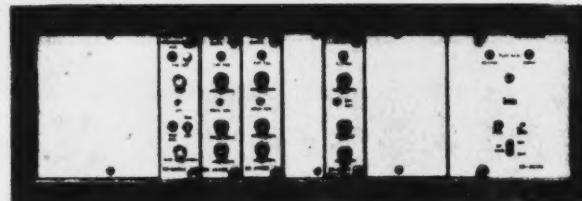


Figure 2:
FV40 Transmit Equipment Shelf equipped with (left to right): blank covering three unoccupied spaces, Video/Subcarrier Combiner (one space), two FM Channel Transmitter units (one space each), blank covering one unoccupied space, one AM Channel Transmitter unit (one space), blank covering two unoccupied spaces, and a DC -48/-21V Converter unit (three spaces).

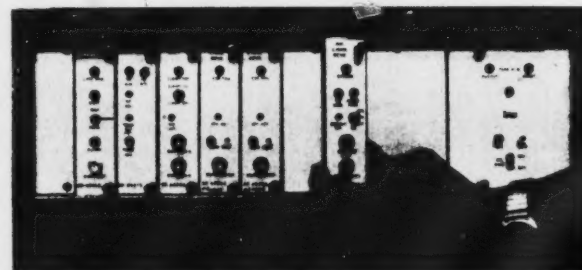


Figure 3:
FV40 Receive Equipment Shelf equipped with (left to right): blank covering one unoccupied space, Video/Subcarrier Separator (one space), System Monitor for pilot and noise (one space), Clamper Amplifier (one space), two FM Channel Receiver units (one space each), blank covering one unoccupied space, one AM Channel Receiver unit (one space), blank covering two unoccupied spaces, and a DC -48/-21V Converter unit (three spaces).

*optional or selectable function

TRANSMISSION PERFORMANCE

Video:	North American 525-Line Service (NTSC)	International 625-Line Service (PAL/SECAM)
Frequency Response		
10 kHz to 4.2 MHz	0.4 dB p-p	
10 kHz to 5.0 MHz		0.5 dB p-p
Line-Time Distortion	1 IRE p-p	±0.5%
Field-Time Distortion	2 IRE p-p	±1%
T-Bar Ringing	4 IRE p-p	
2T Pulse Response		
Pulse to Bar Ratio	±1 IRE	±1%
Ringing	2 IRE p-p	2%
12.5T Pulse Response		
Max. Relative Chrominance Level (RCL)	±1 IRE	
Max. Relative Chrominance Delay (RCD)	±20 ns	
20T Pulse Response		
Max. Relative Chrominance Level (RCL)		±1%
Max. Relative Chrominance Delay (RCD)		±20 ns
Differential Gain 10 to 90% APL	0.5%	0.5%
Differential Phase 10 to 90% APL	0.5°	0.5°
Signal-to-Noise Ratio	67 dB	67 dB
(p-p luminance signal [picture] /rms noise 10 kHz to 5 MHz, EIA/CCIR weighted)		
Signal-to-Hum Ratio (unclamped)	50 dB	50 dB
(p-p luminance signal [picture] /p-p hum dc to 10 kHz)		

FM Audio (Program) Channel:

Frequency Response	1 dB p-p, 40 Hz to 15 kHz
Harmonic Distortion (at rated max. modulation)	1% at +18 dBm channel input level
Signal-to-Noise Ratio (rms test tone at rated max. modulation/ rms noise, with 75µs emphasis)	70 dB

AM Orderwire

Frequency Response	1 dB p-p, 300 Hz to 60 kHz
Signal-to-Noise Ratio	43 dBnc0

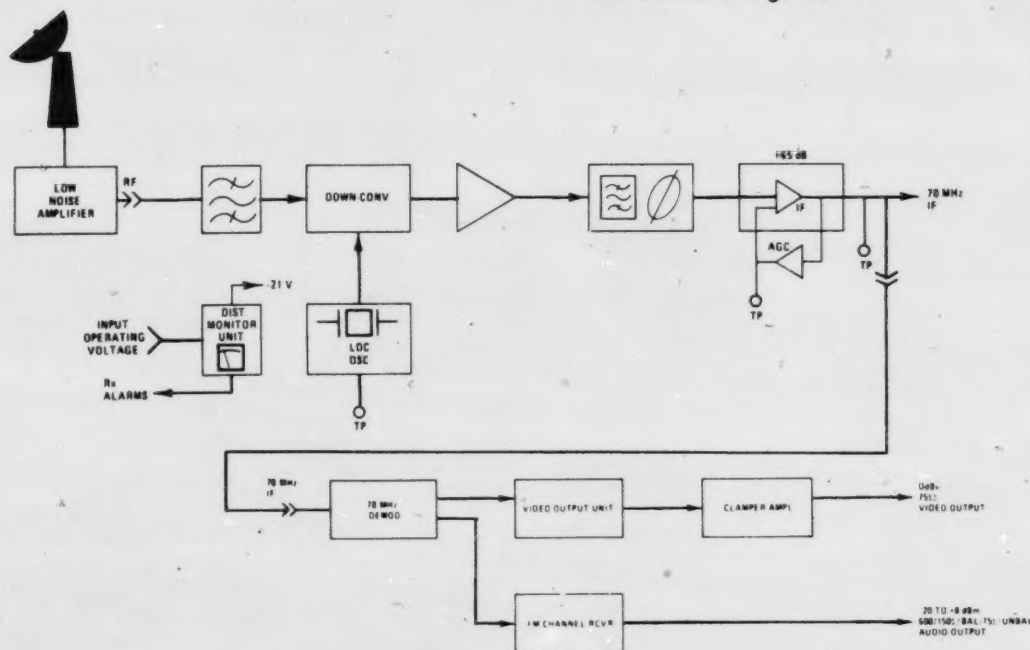
FM and AM Subcarrier Frequency-Set Options (MHz):

6.2	6.7	7.5	8.2	Std. U.S. FM Subcxrs
6.199	6.7	7.5	8.2	Std. U.S. AM Subcxrs
6.17	6.8	7.67	8.3	Std. Canadian Subcxrs
7.02	7.5	8.065	8.59	CCIR FM Subcxrs
5.14	5.36	5.79	6.2	Earth Station applications
4.83				Narrow-band Operation (ENG)
5.8	6.4			Bell System Network Transmission

- NOTES:
1. Other coordinated FM channel frequency sets are available on order.
 2. 7.02 MHz is lowest usable subcarrier for 625-line systems.
 3. A 4.2-MHz video passband must be used with subcarriers below 5.6 MHz.

A High-Quality Microwave Radio System for Use in 4-GHz Satellite Receiving Earth Terminals to Convert Incoming RF Signals into Video/Audio Outputs

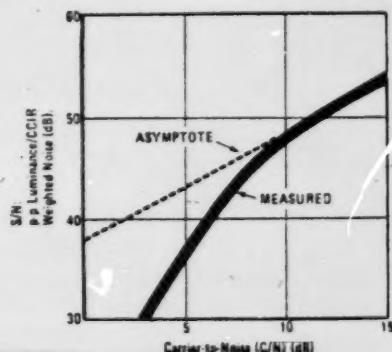
- **SYSTEM COMPATIBILITY** – Fully compatible with 525/625 line NTSC, PAL, PAL-M and SECAM system requirements.
- **CARRIER-TO-NOISE (C/N) METERING** – Continuous metering of carrier-to-noise ratio is provided by built-in panel meter.
- **READILY MAINTAINABLE** – Mechanical design and overall size coordinated so all units are fully accessible for adjustment, testing or replacement.
- **FULLY FACTORY TESTED** – Installation is fast and simple.
- **COMPLETE FACTORY SUPPORT** – System engineering, field service engineering and repair service are provided by experienced telecommunications engineers.



SPECIFICATIONS

Video Performance

	North American 525-Line Service (NTSC)	International 625-Line Service (PAL/SECAM)
Video Output Level	0 dBv, 75 ohms	0 dBv, 75 ohms
Frequency Response		
10 kHz to 4.2 MHz	0.4 dB p-p	
10 kHz to 5.0 MHz		0.5 dB p-p
Line-Time Distortion	1.4 IRE p-p	±0.7%
Field-Time Distortion	2 IRE p-p	±1%
T-Bar Ringing	4 IRE p-p	
2T Pulse Response		
Pulse-to-Bar Ratio	±1 IRE	±1%
Ringing	2 IRE p-p	2%
12.5T Pulse Response		
Max. Relative Chrominance Level (RCL)	±1 IRE	
Max. Relative Chrominance Delay (RCD)	±20 ns	
20T Pulse Response		
Max. Relative Chrominance Level (RCL)		±1%
Max. Relative Chrominance Delay (RCD)		±20 ns
Differential Gain 10 to 90% APL	±2%	±2%
Differential Phase 10 to 90% APL	±0.5°	±0.5°
Signal-to-Hum Ratio (unclamped) (p-p luminance signal to p-p hum, dc to 10 kHz)*	50 dB	50 dB
Video S/N	See graph	
Clamper rejection of energy dispersion waveform	>36 dB	>36 dB



Down Converter Characteristics

Type	Single Conversion
Tunability	Single transponder — xtal and preselector filter change for transponder selection
RF Input	3700–4200 MHz
Frequency Range	Single transponder
Level	-30 to -70 dBm
Noise Figure	15 dB max.
Signals	FM TV carriers
Impedance	50 ohms, coaxial
Return Loss	22 dB
Frequency Stability (local oscillators)	±0.003%
IF Output	
Frequency	70 MHz
Bandwidth	30 MHz, 40 MHz optional
Impedance	75Ω unbalanced
Level	+1 dBm to -7 dBm, -1 dBm nominal

FM Audio (Program) Channel Performance

Frequency Response	1 dB p-p, 40 Hz to 15 kHz
Harmonic Distortion (at rated max. modulation)	1% at +18 dBm channel output level
Signal-to-Noise Ratio (rms test tone at rated max. modulation/rms noise with 75 μs emphasis)	60 dB typical
Level	+8 dBm nominal, 600/150 ohms, balanced or 75 ohms, unbalanced

Prime Power Requirements

Operating Voltages	-21 Vdc, regulated ±0.5%
	-24 Vdc, nominal (-22 to -28 Vdc range) or
	-48 Vdc, nominal (-44 to -56 Vdc range) or
	115/230 Vac (105 to 125 Vac or 210 to 250 Vac ranges), 50-60 Hz, single phase
Power Consumption	130 watts max.

*Excluding the effects of the satellite energy dispersion signal

Farinon

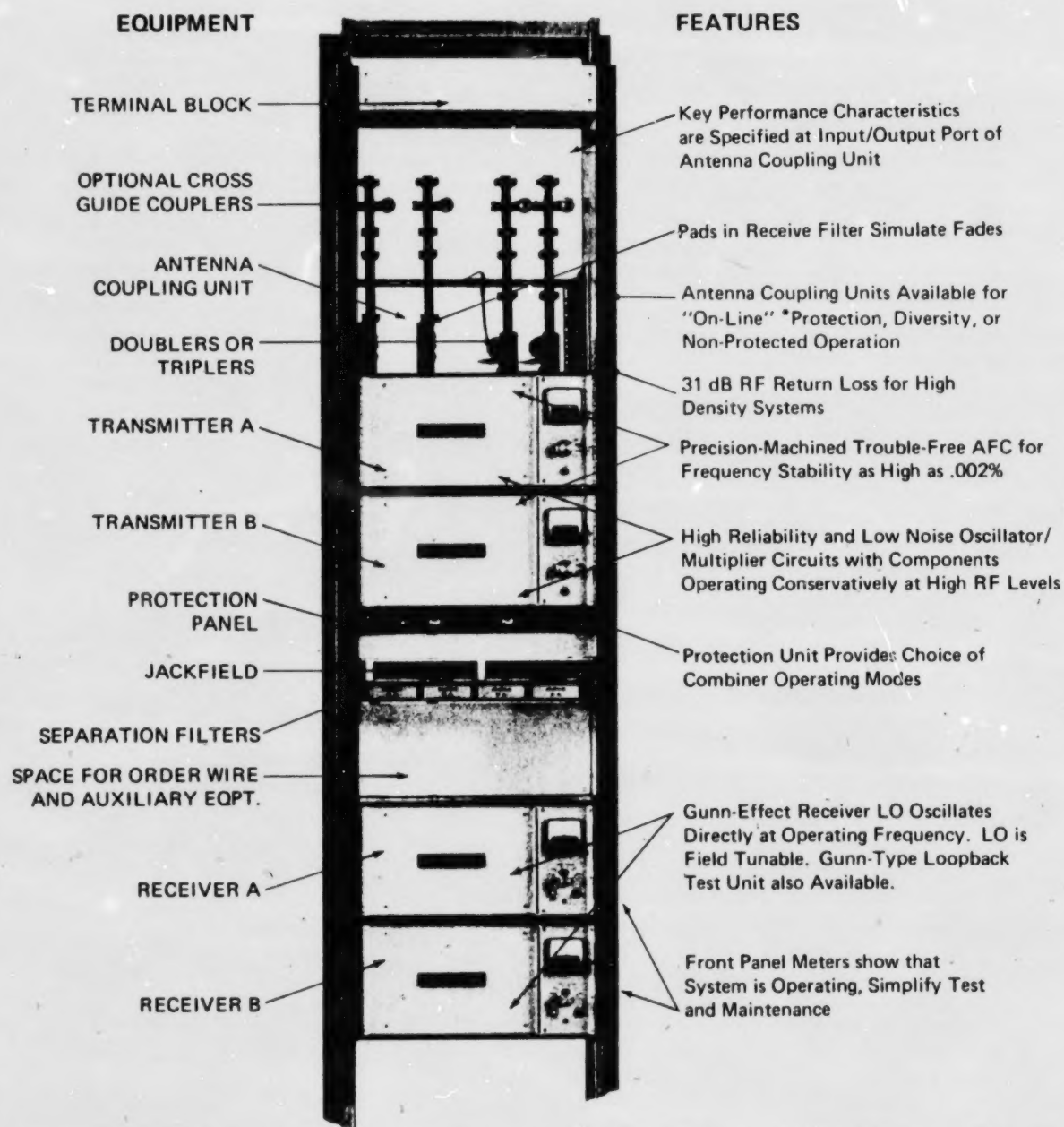
Farinon Electric, 1691 Bayport, San Carlos, CA 94070 • Phone: 415/592-4120 • Tlx 34-8491

Farinon Electric of Canada, Ltd., 657 Orly Ave., Dorval, PQ H9P 1G1 • Phone: 514/636-0974 • Tlx 05-82-1893

Farinon

SOLID-STATE MICROWAVE FOR THE 11, 12 AND 13 GHz BANDS

Up to 1200 Voice or Data Channels, or Video



Complete Terminal Occupies 44 Rack Mounting Spaces. Can Be Mounted in Any 19" Rack or Cabinet.

Figure 1. Typical SS11000 or SS12000 Protected Assembly. Antenna Coupling Unit Shown is for Connection to Separate Dual-Polarized Transmit and Receive Antennas.

*Patented by Farinon

FARINON ELECTRIC, 1691 Bayport, San Carlos, CA 94070 ■ Phone: (415) 592-4120 — Tlx 34-8491

FARINON ELECTRIC OF CANADA, LTD., 657 Orly Ave., Dorval, PQ H9P 1G1 ■ Phone: (514) 636-0974 — Tlx 05-82-1893

SYSTEM DESCRIPTION

Farinon Types SS11000 and SS12000 microwave systems transmit as many as 300, 600 or 1200 high-quality voice or data channels, or one video channel in the frequency bands between 10,550 and 13,250 MHz. Within the United States, appropriate systems provide optimized service as follows:

Frequency Band	Service
10.7 - 11.7 GHz	Common Carrier Fixed
12.2 - 12.7 GHz	Operational Fixed
12.7 - 13.25 GHz	Television Services

Equipment for the common carrier band is fully compatible with the requirements of the Bell telephone system. For operation in countries other than the United States, and for other applications, SS11000 and SS12000 equipment is furnished as needed to conform with applicable CCIR or local governmental regulations.

With per-channel noise specified as less than 17.5 dBmC for 600 channels at full deviation, remodulating repeaters are practical for most applications. This permits maximum flexibility when engineering multihop routes requiring access to the baseband for channel dropping and re-inserting at intermediate points.

The basic microwave transmitters and receivers can be arranged for frequency diversity, space diversity or for single-frequency operation. Optional transmitter protection for single-frequency operation utilizes a unique on-line configuration in which the transmitters are phase-locked so that their outputs can be combined into a single signal for transmission. The combined signal provides higher usable output power without introducing additional distortion. Appropriate combiners are used with receivers to provide optimum performance in systems operating either with or without diversity.

EQUIPMENT DESIGN AND CONSTRUCTION

Figures 1 through 6 show details of SS11000/12000 transmitters, receivers and assemblies. Figure 7 has block diagrams of the basic units. Transmitters and receivers are in separate frames which are identical in size and similar in appearance. They mount in standard 19" telephone-type relay racks or in any standard radio-type cabinet. Each transmitter or receiver occupies five 1 1/4" mounting spaces.

Doors on the front of each unit swing open to provide complete access to all circuits and components. Lower frequency circuits are on printed circuit cards which slide into enclosures on the left-hand door. Higher-frequency circuits are mounted on the back plate of each frame.

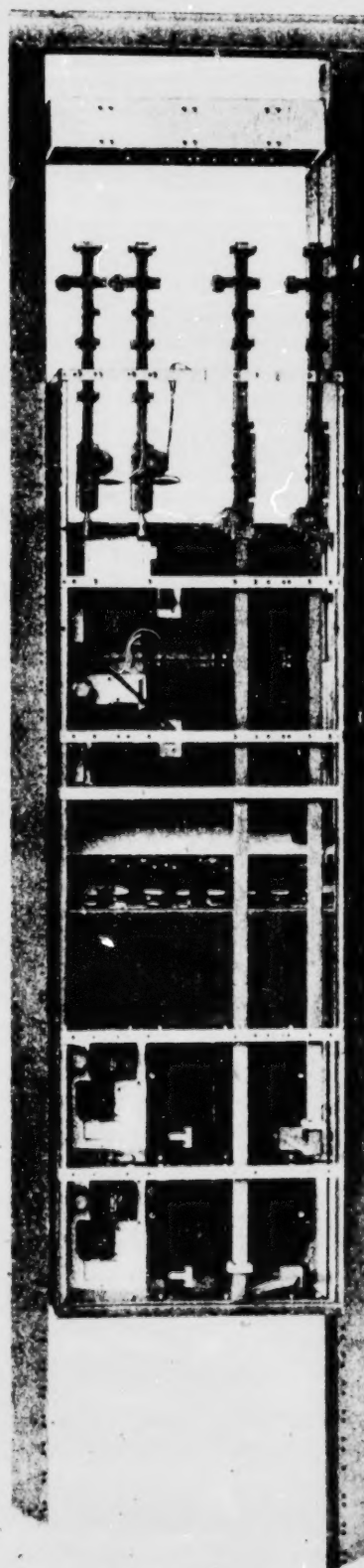


Figure 2. Rear of SS11000 Diversity Terminal for connection to separate antennas.

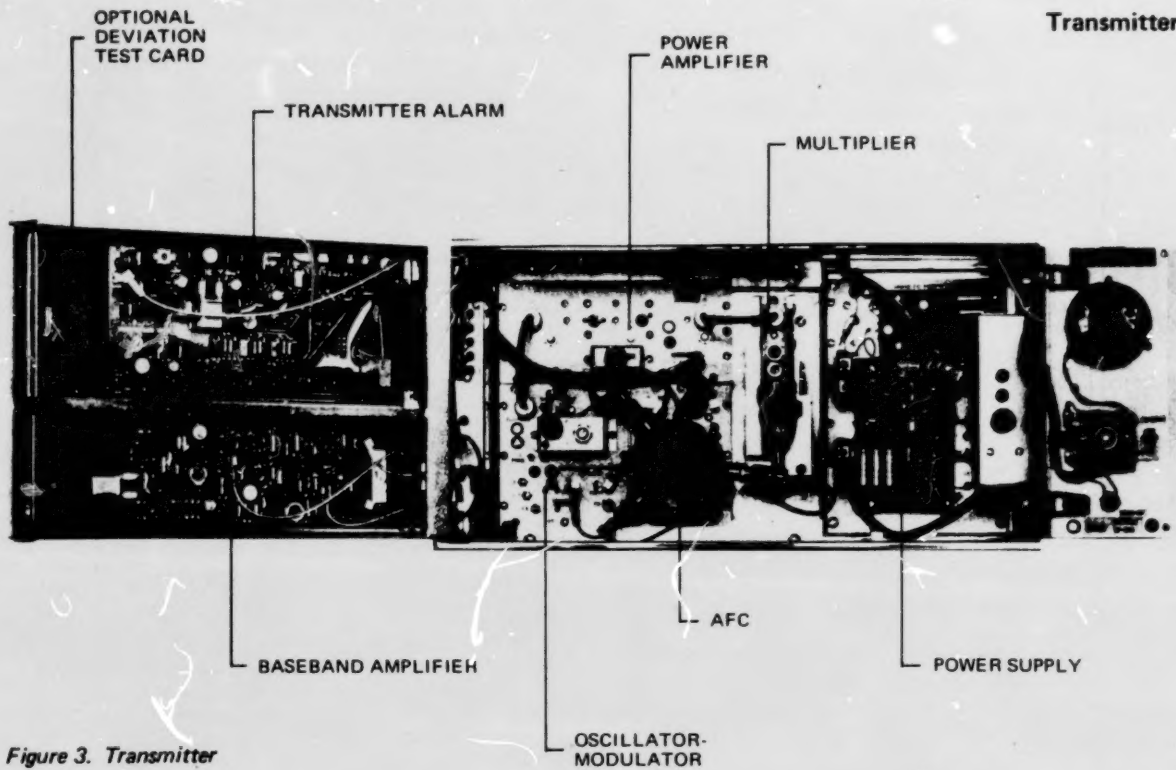


Figure 3. Transmitter

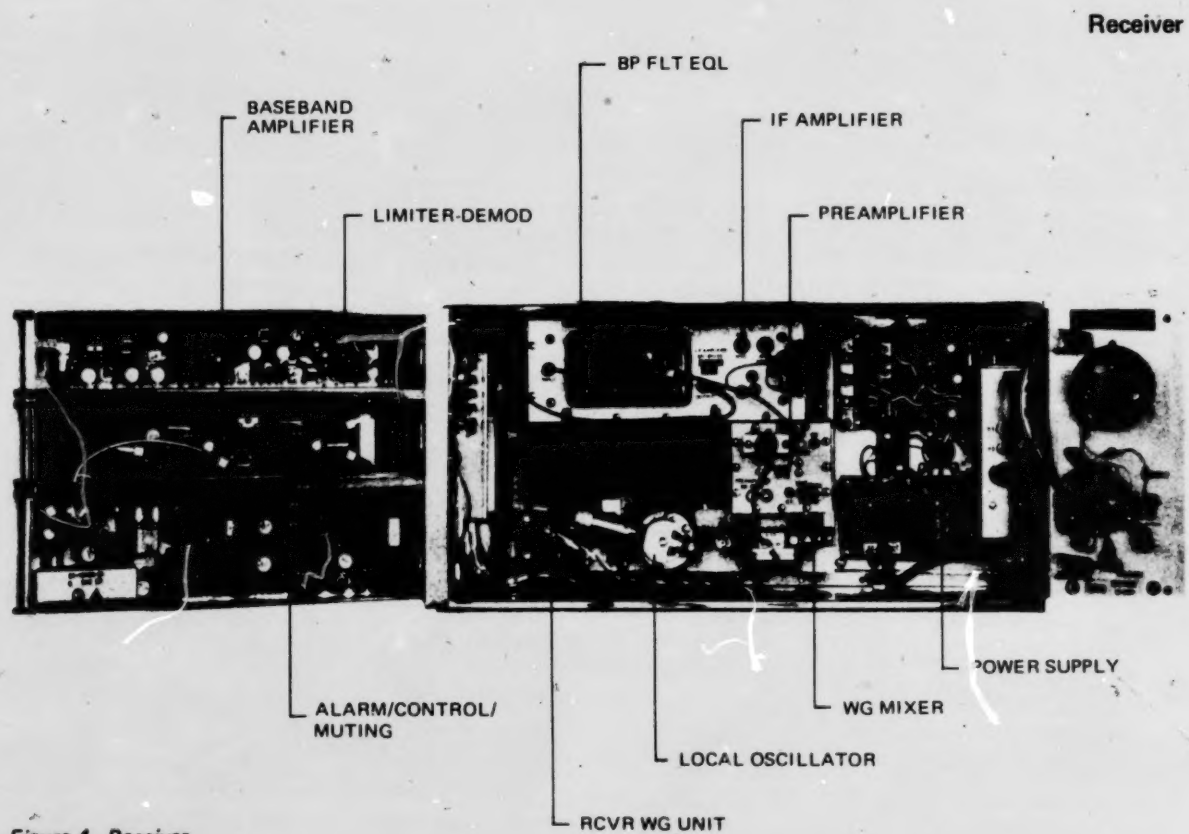


Figure 4. Receiver

TRANSMITTER

Transmitters for SS11000 and SS12000 microwave systems are similar to those used in Farinon SS6000 systems. The basic transmitter drives a doubler or tripler in the antenna coupling unit to provide the desired output frequency. As indicated in Figure 3, the transmitter baseband amplifier and the transmitter alarm circuits are mounted in the door; the oscillator-modulator, power amplifier, multiplier and transmitter AFC circuits are mounted on the backplate.

An optional deviation test circuit may also be mounted with the alarm circuit card on the transmitter door. This card provides a quick means for checking standard transmitter deviation with standard test equipment.

A conventional CCIR pre-emphasis network is included in the baseband amplifier of transmitters for message service. An appropriate pilot, conforming to CCIR recommendations, is injected into the baseband at the emitter of the first stage of the baseband amplifier. Special versions of SS11000 can be furnished without emphasis networks for locations where TL-2 compatibility is required.

The oscillator-modulator unit operates at one twenty-seventh or one thirty-sixth the output frequency to the antenna. An output of about 15 watts from the two-stage power amplifier is delivered to the varactor multiplier. Sufficient power is available at the multiplier output to assure ample margin for meeting power output specifications for all equipment configurations

and frequency ranges. The oscillator-modulator operates at a relatively low frequency so that the solid-state components can operate conservatively. This results in a lower overall noise contribution from the oscillator-modulator circuits than is normally found where transistors are operated close to their top frequency in order to reduce the multiplication factor of the varactor chain.

There are two probes in the output stage of the multiplier unit. One is connected to the power measuring and power alarm circuits; the other supplies power to a cavity-type discriminator/AFC unit in the transmitter. The output frequency is continuously monitored, with any changes detected in the discriminator whose output in turn controls the frequency of the basic oscillator in the oscillator-modulator unit.

A temperature-compensated invar cavity provides the basic reference for frequency control. Exceptional frequency stability is achieved through the use of Farinon-developed techniques for manufacturing and assembling the invar cavity.

RECEIVER

All receiver circuitry up to and including the IF amplifier is mounted on the receiver backplate. The limiter demodulator and subsequent circuits indicated in the block diagram of Figure 7 are mounted on the door of the receiver frame. The receiver pre-amplifier plugs directly in the waveguide mixer which connects directly to the receiver waveguide unit.

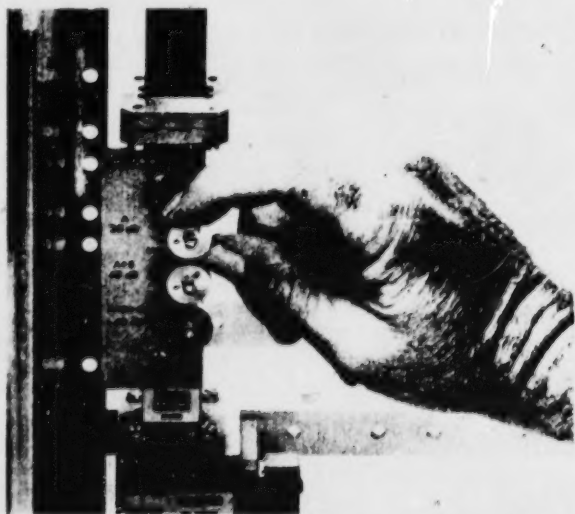


Figure 5. Pads in Receive Waveguide Filters Simulate 20 or 40 dB Fades or Over 60 dB Attenuation.



Figure 6. Gunn Diode Local Oscillator Assembly

SS11000/SS12000 receivers feature a Gunn diode local oscillator which oscillates directly at microwave frequencies. Frequency multipliers are not needed. With the current state-of-the-art, low-power Gunn diodes are well suited for receiver local oscillator use.

The Farinon Gunn diode assembly is both simple and reliable. The high-Q oscillator has extremely low FM noise. In addition the oscillator is very stable so neither AFC nor phaselock circuitry is needed. The Gunn diode assembly is mechanically tunable by changing the cavity dimensions. Both coarse and fine adjustments are provided so that each unit can be tuned over a 10% range. This simplifies maintenance and reduces requirements for spare units.

In addition to being simpler and more reliable than other types of local oscillators, the Gunn diode assembly greatly simplifies loop-back testing of transmitters and receivers. Within a few minutes the complete LO assembly can be removed and replaced by a test unit tuned to ± 70 MHz away from the local transmitter frequency. Then a sample of the transmitted signal can be taken from the crossguide coupler to a decoupled insertion probe in the receiver waveguide. Because of the ease of tuning the Gunn diode assembly, a single test unit can be calibrated for use at many different frequencies.

Antenna coupling units for the various configurations of SS11000/SS12000 transmitters and receivers are shown in Figure 7. Doublers or triplers, isolators, filters, and circulators are provided as required for each configuration. An optional cross coupler provides a convenient means of measuring transmitter power accurately and of making loop-back tests and measurements.

PROTECTION SYSTEMS/DIVERSITY OPERATION/ON-LINE PROTECTION

SS11000 and SS12000 microwave systems can be arranged for any desired method of operation. Several standard arrangements provide protection against equipment malfunctions or propagation-caused outages. The operating mode used will depend on economic considerations, on the type of service to be provided, on the location of the equipment, and on many other factors.

SS11000 and SS12000 transmitters are available with a Farinon-developed protection system in which the outputs from two transmitters are combined and placed "on-line" together for transmission to the distant terminal. The two transmitters are simultaneously modulated with the same baseband input, and their outputs are phase-

locked to permit their combination into a single signal without introducing additional distortion.

The basic phase-locked loop and combining circuits for a system with on-line protection are a part of the antenna coupling unit. Both transmitters are connected to the antenna waveguide through a 3-dB hybrid. Phase relationships are adjusted so the sum of the two inputs appears at the antenna port, and essentially no power appears at the difference port. If either transmitter is interrupted, the output from the remaining transmitter splits in the hybrid, with half going to the antenna and half to the dissipating load in the difference port.

Receiver options are available to provide frequency diversity, space diversity or single-frequency/single-antenna protection configurations. In the latter case, receiver equipment protection is provided by the use of either an equal-loss RF hybrid or an unequal-loss directional coupler in the antenna coupling unit to split the signal and feed two receiver subassemblies. The choice of a hybrid or directional coupler is a customer-specified option and depends on path engineering considerations.

In all protected systems, whether single frequency or two-frequency, the baseband outputs from the two receivers are combined or selected as required to provide the best system performance.

COMBINERS

Protection systems for SS11000 and SS12000 microwave provide a choice of two modes of operation, "equal-gain-combining" and "optimal-selection". In the equal-gain-combining mode, the outputs of the two receivers are combined so long as the noise in the two outputs does not differ by more than 5 dB. When the difference is greater than 5 dB, the noisier receiver is muted. Thus, there can be a 3 dB overall combiner advantage when the noise from the two receivers is equal, and the combiner output is normally at least as good as the output from the best receiver. Neither transients nor baseband level jumps are caused by receiver muting.

In the optimal-selection mode, the protection system operates as a "make-before-break" switch which selects the output from the quieter of the two receivers. Switching between receivers occurs whenever there is a difference of 3 dB or more in their signal-to-noise ratios. The advantage of the optimal selection mode is that it eliminates the effects of differences in absolute transmission delay between the two paths of a space-or-frequency diversity system. This delay can have

severe effects as the width of the system baseband increases, and can significantly affect end-to-end frequency response and intermodulation noise. Transfer between receivers initiated by noise is accomplished without baseband interruption.

A major advantage of the Farinon combining method is that the operating mode can be field-changed (by strapping). Thus, a system initially using the combining mode can be strapped for optimal-selection operation should the effects of absolute delay caused by unforeseen variations in the transmission path cause excessive degradation of frequency response or noise performance.

Logic circuitry prevents false switching from internal failures or loss of baseband continuity.

METERING, ALARMS AND TEST FACILITIES

All Farinon microwave terminals include a number of interrelated facilities for readily determining the condition of operating equipment, for alerting the user to equipment malfunctions, and for simplifying the maintenance of installed systems. Each receiver and transmitter has a front panel meter with a multiposition switch. Switch positions are shown in Figure 7. They provide direct readings of vital operating parameters such as transmitter power output and receiver AGC voltage. In addition, each meter has the capability of making external measurements so that conditions at other key positions within the equipment can also be determined. Thus, routine performance checks can be made without the use of additional test equipment.

Alarm circuitry in each transmitter and receiver for message service provides continuous monitoring of transmitter output power, transmitter AFC, transmitted pilot, received pilot and high receiver noise (muting). Each transmitter and receiver has an alarm lamp and provision for operating an external alarm. In addition, individual relay contacts are optionally available for each of the three transmitter and two receiver alarm conditions.

BASEBAND TREATMENT AND ASSEMBLY ARRANGEMENT

Type SS11000/SS12000 transmitters and receivers provide a continuous baseband. External filters are used to separate the baseband into the desired segments for service channel, message circuits, supervisory circuits, etc. The filters used in any installation will, of course, depend on the type of multiplex used and on the frequencies used for supervisory tones.

Transmitters and receivers (or receiver combiners) can be optionally equipped with up to three identical, isolated baseband inputs and outputs. This option eliminates the need for external equipment at repeaters where baseband access is required for dropping or inserting channel groups, for orderwire or alarm circuits, or for connection to branching routes. The multiple access option provides high isolation at minimum cost.

A typical equipment rack arrangement is shown in Figure 9. Any or all of the auxiliary equipment shown can be furnished or omitted, depending on the application. Other equipment arrangements can also be furnished although, if no specific instructions or requirements are imposed by the user, the arrangement shown is normally provided.

MULTIPLEX AND ACCESSORY EQUIPMENT

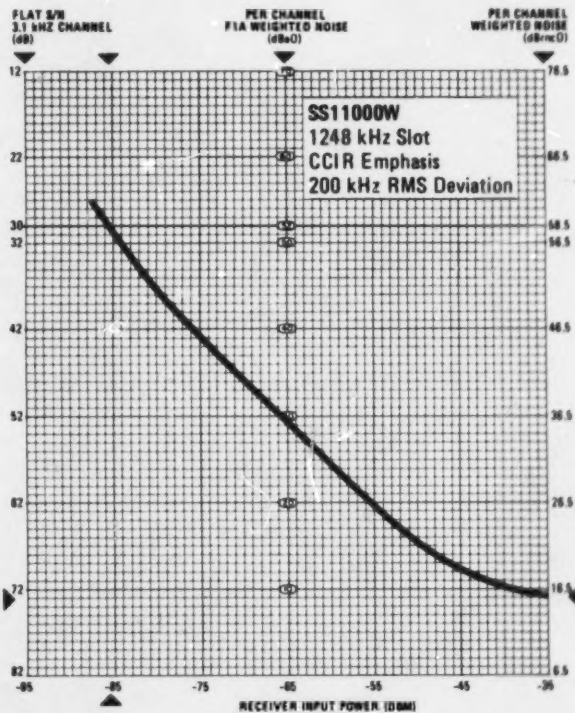
Various types of multiplex can be furnished with Farinon microwave to derive the number and type of voice channels required by the application. For example, the full capacity of the system can be obtained by applying a CCITT-type multiplex such as Farinon FC, which occupies the portion of the baseband above 60 kHz.

Baseband frequencies below 60 kHz can be used for supervisory or control functions, or up to 12 additional voice channels can be derived by applying groups one and two of Farinon Type LD multiplex. A channelizing arrangement often recommended where flexibility in channel terminations is desired is the use of up to 48 channels of LD multiplex to occupy baseband frequencies below 284 kHz (supergroup 1 frequencies). Then the portion of the baseband above 300 kHz can be channelized with Type FC or other conventional CCITT multiplex.

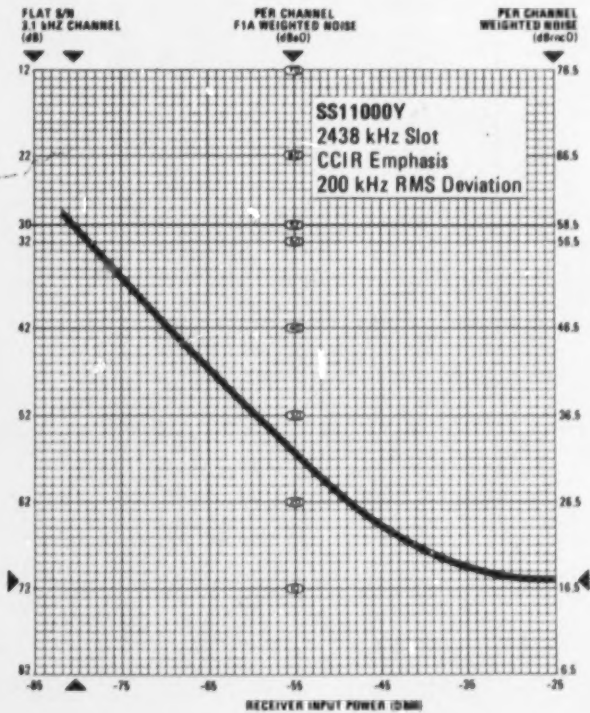
Other accessory equipment such as service channels, baseband separation filters, tone equipment jackfields terminal blocks, etc., can be provided with Farinon microwave terminals as part of factory-wired and tested terminal assemblies.

REFERENCE DRAWINGS:

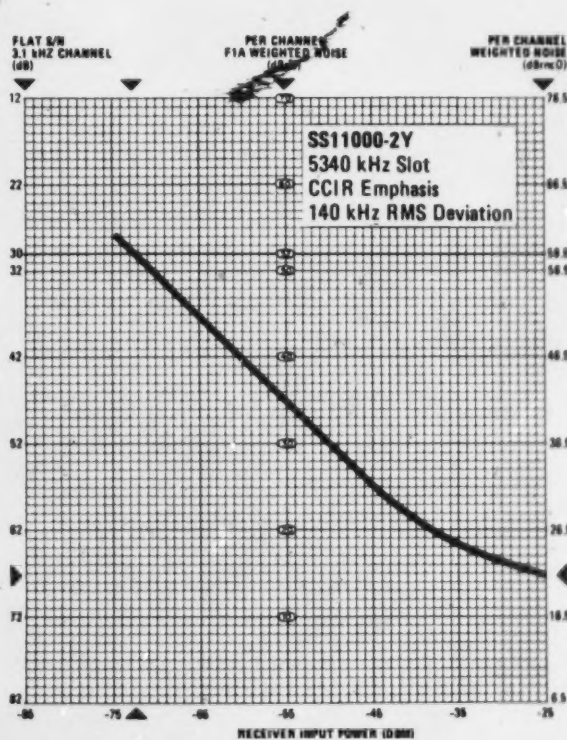
BL-81550	SS11000 Transmitters and Receivers
BL-81650	SS12000 Transmitters and Receivers
BL-81547	Frequency Diversity Operation, Equal-Gain-Combining or Optimal Selection.
BL-80948	On-Line Protection, Equal-Gain-Combining or Optimal Selection.



8a, optimized for 300 channels,
200 kHz rms deviation at 790 kHz



8b, optimized for 600 channels,
200 kHz rms deviation at 1617 kHz



8c, optimized for 1200 channels,
140 kHz rms deviation at 3427 kHz

Figure 8. Performance characteristics for SS11000 microwave. Curves show the worst performance normally expected in the highest CCIR-recommended measurement channel for a non-protected system. For protected systems, or for systems in other frequency bands, appropriate corrections should be made in the thermal noise portion of the curves, considering the differences in noise figures.

PERFORMANCE CHARACTERISTICS, SS11000 and SS12000 MICROWAVE

SYSTEM SPECIFICATIONS APPLICABLE TO ALL BANDS

Operating Frequency Range:

SS11000	10,700-11,700 MHz
SS12000	12,200-13,250 MHz

Operating Frequencies:

SS11000 and SS12000 equipment coordinates with existing systems operating in the same bands in the United States and Canada; similar considerations apply in the choice of two-frequency or four-frequency plans. The frequency plan shown in CCIR Rec 387-2 (Geneva, 1974) Figure 1 is recommended for other areas.

NOTE: Transmitters and receivers for message service use different base-band amplifiers than those for video service.

System Designators:

SS11000W/SS12000W	300-Channel Message Service
SS11000Y/SS12000Y	600-Channel Message Service **
SS11000-2Y/SS12000-2Y	1200-Channel Message Service ***
SS11000VC/SS12000VC	Video Service

NOTE: Consult factory for information on FCC Type-Accepted systems.

VARIABLE SPECIFICATIONS

FARINON TYPE NUMBER	SS11000W SS12000W	SS11000Y SS12000Y	SS11000-2Y SS12000-2Y	SS11000VC SS12000VC
Capacity	300 ch	600 ch	1200 ch	Video
Per-channel rms deviation	200 kHz	200 kHz	140 kHz	Not applicable
Baseband Frequency Response (± 0.5 dB)	0.3-1300 kHz	0.3-3084 kHz **	0.3-5780 kHz ***	30 Hz - 5 MHz
Internally Generated Pilot	1499 kHz	4715 kHz *	8500 kHz	As required
IF Bandwidth 3 dB Points (approx.)	12 MHz	25 MHz	32 MHz	25 MHz
Loaded Channel Noise	15.5 dBmC 28 pWp0 (56.5 dB NPR) 0° to 50°C	17.5 dBmC 44.5 pWp0 (54.5 dB NPR) +10° to 40°C	21.5 dBmC 112 pWp0 (50.5 dB NPR) +10° to 40°C	Not applicable
Receiver Test Tone Output Levels: Single Output Multiple Outputs	-18 or -20 dBm -20 dBm	-20 dBm -23 dBm	-23 dBm -23 dBm	1.0 v p-p

Transmitter Test-Tone Input Level:

Message Service:

-35 dBm per channel recommended: (-42 dBm or -45 dBm also available if required).

Baseband Input and Output Impedance:

75 ohms, unbalanced, 26 dB return loss

Service-Channel Noise: (0.3-3.0 kHz)

35.5 dBmC

VSWR:

1.1:1 at antenna waveguide flanges of coupling unit.
(Return loss 26 dB)
1.06:1 (Return loss 31 dB) is standard for 1200-channel systems, optional with others.

Operating Ambient Temperature Range:

-30°C to +65°C (-22°F to +149°F)

Power Sources:

-24 (22-28), or -48 (44-56) vdc or
105-125/210-250v, 50-60 Hz ac, single phase

Power Requirements:

Single transmitter 55 watts, typical
Single receiver 30 watts, typical
Maximum per Xmtr/Rcvr pair 100 watts.

External Connections:

Baseband, alarm and power connections appear at the side of each transmitter and receiver frame. They are normally cabled to the top of the bay for external connections. The baseband connectors are Type BNC female. Waveguide flanges are provided at the top of the equipment bay, Type CPR-90 or CMR-90 for SS11000, Type WR-75 (cover) for SS12000.

Dimensions:

Transmitters and receivers mount on standard 19" racks or cabinets. Each occupies 8 1/2" of vertical rack space (five mounting spaces).

An unprotected terminal assembly occupies a minimum of 17 rack mounting spaces. A protected terminal assembly occupies a minimum of 35 rack mounting spaces.

Equipment projects 5 1/4" from front face of rack. Overall equipment depth is 15 1/4".

*Other CCIR pilots also available

**Permits 732-channel loading

***Permits 1332-channel loading

TRANSMITTER CHARACTERISTICS

Power Output:

(at output flange of antenna coupling unit)

	10,550-11,700 MHz	12,200-12,700 MHz	12,700-12,950 MHz	12,950-13,250 MHz
Frequency Diversity or Non-protected	0.56 watt +27.5 dBm	0.56 watt +27.5 dBm	0.5 watt +27.0 dBm	0.45 watt +26.5 dBm
On Line Protection (Two Transmitters)	0.89 watt +29.5 dBm	0.89 watt +29.5 dBm	0.79 watt +29.0 dBm	0.71 watt +28.5 dBm
Monitored Hot Standby	0.35 watt +25.5 dBm	0.35 watt +25.5 dBm	0.32 watt +25.0 dBm	0.28 watt +24.5 dBm

Modulator Type: FM

Pre-Emphasis (Message):

Per CCIR Rec 275-2, Geneva, 1974
Transmitters without emphasis also
available.

Frequency Stability:

-30°C to +50°C ±0.005%
+10°C to +40°C ±0.002%

Alarms:

- (1) Integral low-rf-power alarm
- (2) Loss of Pilot
- (3) Off-frequency alarm

Separate relay contacts are optionally
available for each alarm for extension to
remote indicators.

RECEIVER CHARACTERISTICS

Noise Figure:

(at the input flange of the antenna coupling unit):

	10,550-11,700 MHz	12,200-12,700 MHz	12,700-13,250 MHz
Non-Protected	9 dB	9.5 dB	10 dB
Protected	9.5 dB	10 dB	10.5 dB

Intermediate Frequency:

70 MHz

Image Rejection:

75 dB, minimum

Spurious Baseband Tones:

-70 dBm0, maximum (60 kHz -top BB frequency)

Alarms:

- (1) NODAN (Noise-Operated Device Anti-Noise)
- (2) Pilot-Tone-Actuated

Separate relay contacts are optionally available for each
alarm for extension to remote indicators.

VIDEO CHARACTERISTICS (NTSC 525 Line System)

Pre-Emphasis:

Per CCIR Rec 405-1, Geneva, 1974.

Transmitter Deviation:

8 MHz p-p at 760 kHz (without program subcarrier)

Differential Phase:

(10 to 90% APL) 0.5° max

Differential Gain:

(10 to 90% APL) 0.2 dB max

60-Hz Square Wave Tilt:

1.0% max.

Video Signal/Noise:

(p-p video/rms unweighted noise 10 kHz -4.3 MHz)
65 dB min.

Hum Level:

(p-p video/p-p hum): 50 dB min.

K Rating (2T Pulse):

1%

Transmitter Baseband Input Level:

1.0 v p-p nominal

Receiver Baseband Output Level:

1.0 v p-p nominal

Modulation Bandwidth:

30 Hz - 8.0 MHz

FM and AM subcarrier units meeting requirements of EIA
Spec RS-250A can be furnished as auxiliary equipment if
required. Subcarrier frequencies 6.2, 6.7, 7.5, and 8.2 MHz
are available. Clamping units also available as auxiliary
equipment are recommended on routes involving three hops
or more. Consult Data Sheets 7328 and 7430 for details.

APPENDIX G

Infomedia Corporation Capabilities

The Planet System

INTRODUCING

● THE PLANET SYSTEM

- When NASA experts needed to manage seventeen research projects running on the Communications Technology Satellite, they linked all the principal investigators together through the **PLANET** system.
- When U.S. Geological Survey scientists had to expand their participation in the international exchange of mineral and petroleum data bases they sponsored a **PLANET** computer conference in which nine countries participated.
- When the European Management Forum, a prestigious business conference on the Continent, had to obtain expert opinions on technology transfer to less-developed countries, they installed **PLANET** terminals in Switzerland to communicate with economists in New York and California.
- **PLANET** has also been used by Lilly Endowment to explore policy decisions in educational data bases, and by the Kettering Foundation in studies of the relationship of weather patterns to food supplies.

The **PLANET** system is a unique computer program running on an international network. It is *not* just another system for electronic mail or complicated text-editing. It is designed to be operated by busy people who do not have time to master a lengthy manual, but have a job to do that involves communication with business contacts or scientific colleagues in Canada, in Japan, in Holland, in France. . . .

Unique, too, is **PLANET**'s ability to assist you in the management of a project from any location — even from your hotel room when you travel; any time of day or night.

Get in touch with us at (415) 321-2682 for information regarding terminals, rates, network access, or additional details about the **PLANET** system.

APPENDIX H

Letters of Commitment to Subcontract

- o University of Kentucky Research Foundation
- o Department of Education
Archdiocese of San Francisco
- o Public Service Satellite Corporation
- o RCA American Communications, Inc.

University of Kentucky Research Foundation

March 20, 1978

Rusty Welch, Director
Special Education Satellite Project
Council for Exceptional Children
1920 Association Drive
Reston, VA 22091

Dear Mr. Welch:

This letter documents the commitment of the University of Kentucky Research Foundation to participate in the Special Education Satellite Project that you are proposing to the National Institute of Education. Specifically, personnel in our Department of Special Education are prepared to sub-contract with your organization for activities associated with the evaluation component of this project.

We have examined a draft of the sub-component activities and budget for this component. The total budget of \$95,175 is appropriate, with \$90,311 coming from the NIE sub-contract and \$4,864 representing cost sharing from our Foundation.

We look forward to working with you on this important project.

Sincerely,


James Y. McDonald
Executive Director

JYM/mm



DEPARTMENT OF EDUCATION

ARCHDIOCESE OF SAN FRANCISCO
443 CHURCH STREET
SAN FRANCISCO, CALIFORNIA 94114
(415) 552 3620

March 20, 1978

Mr. Russell Welch
Council for Exceptional Children
1920 Association Drive
Reston, Virginia 22091

Dear Rusty:

Thank you for our copy of the draft proposal to the National Institute of Education for educational applications of communications satellites. In assuring you of the active participation of our Department, our Educational Television Center, and our Project Interchange Consortium, I would like to emphasize those aspects of the proposal from which our teachers and students may derive the greatest benefit and to which we can make the greatest contribution out of our own experience and resources.

The Individualized Education Plan (IEP), which is the focus of the proposal in accordance with P.L. 94-142, represents instructional design and methods with which teachers in our system (and in cooperating public school districts of the Bay Area) have worked intensively for nearly ten years. This experience has convinced us that "IEP" techniques are urgently needed not only for the handicapped but for the whole spectrum of learning needs and may represent the only practical way in which all students may learn and live with each other in the "most liberating" as well as the "least restrictive" environment. While initial emphasis on the handicapped is appropriate, I trust that the ready "expandability" of project activities to every type of student is clearly understood as one of the merits of the proposal.

The same experience enhances our interest in teacher development as a first priority, including teacher involvement from the outset of planning new strategies and delivery systems. Project Interchange has demonstrated, with limited time and resources, that experienced teachers are our prime resource in planning, as well as implementing, innovative practices in our schools.

Satellite applications and related communications options (cable, microwave, telephone, ITFS) may be the only way to remove geographical and logistical barriers to the communication with teachers and between teachers that is absolutely essential to educational change of the scope and rate required by P.O. 94-142. I am very happy that the satellite research and capabilities of the University of Kentucky's Special Education Department will be a major project component. I am equally confident that Project Interchange, with its own unique CTS/ITFS/CATV capabilities and experience, can also enhance the process.

March 20, 1978

Finally, the consortium which CEC is enlisting to carry out this plan represents an element that may have more importance than can be reflected in the present proposal. The swift and radical innovation which P.L. 94-142 mandates (and which communications technology can facilitate) may never be realized without comparable innovation in organizational relationships and management techniques. I think the diversity of the consortium, together with the unique capabilities of each member, is a special merit of the proposal. Our own past consortium experience, especially in Project Interchange, makes us eager and optimistic in this larger undertaking.

My thanks again in behalf of Project Interchange for the leadership of CEC and for your own personal efforts in developing this proposal.

Sincerely,

Pierre DuMaine
Reverend Monsignor Pierre DuMaine
Superintendent of Schools

v

Public Service Satellite Consortium

March 20, 1978

Map 2-1-1978

Mr. Russell Welch
Assistant Executive Director
Unit Development
Council for Exceptional Children
1920 Association Drive
Reston, Virginia 22091

Dear Rusty:

This letter should serve as a basis for a Memorandum of Understanding between the Public Service Satellite Consortium (PSSC) and the Council for Exceptional Children (CEC) and its subcontractors (ETV Center, Archdiocese of San Francisco and University of Kentucky) for the PSSC to participate in technical planning and service development for the operational phase of the CEC's Special Education Satellite Project.

The PSSC supports CEC's proposal to establish an operational network which will meet the needs of its constituents. The PSSC will provide the expertise of its technical, planning, and service development staffs in assisting the CEC in the design and implementation of an operational system capable of satisfying CEC service delivery requirements as defined by SESP.

Conduct of Services

- . PSSC will review and update the needs of the CEC with its requirements for satellite service.
- . PSSC will assist in evaluating available satellite telecommunication systems which can meet CEC service delivery requirements.
- . PSSC will address likely technical and cost elements of those systems in effecting ECE's access to economical end-to-end service.
- . PSSC will assist in examining marketing strategies for telecommunications service delivery.
- . PSSC will assist in examining earth station configuration for use of experimental and commercial satellites for CEC target populations.
- . PSSC will assist in examining terrestrial systems which can extend distribution to CEC target populations.
- . PSSC will assist in coordinating arrangements with common carriers for transmission on commercial satellite systems.

PRINCIPAL OFFICE:
4040 SORRENTO VALLEY BOULEVARD
SAN DIEGO, CALIFORNIA 92121
714-452-1140

2480 WEST 26th AVENUE
DENVER, COLORADO 80211
303-458-7277

1126 16th STREET, N.W.
WASHINGTON, D.C. 20036
202-659-2277

- PSSC will assist in coordinating arrangements for extended terrestrial distribution through the PTSS, ITFS, CATV, MDS, and others.
- PSSC will assist in evaluating the acceptance and effectiveness of alternative modes of service delivery.
- PSSC will assist in examining the prospects for emerging technology and generate appropriate recommendations.
- PSSC will prepare appropriate reports which provide the above information in conjunction with operational recommendations and the associated costs.

Payment for Assistance

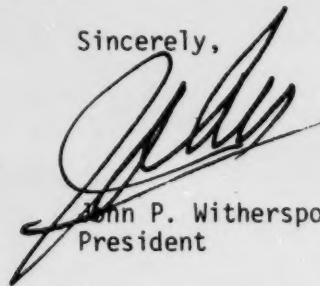
PSSC will execute the above list of tasks and/or other appropriate tasks on a cost reimbursable basis for CEC and its subcontractors. The estimated performances of services will be delineated in the Memorandum of Understanding.

Start Date

The start date is dependent upon the grant to the CEC and will be defined in the Memorandum of Understanding.

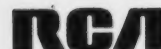
Be assured we stand ready to assist.

Sincerely,



John P. Witherspoon
President

MAR 21 1978



Mr. Rusty Welsh
Council for Exceptional Children
1920 Association Drive
Reston, Virginia 22091

Subject: Cost estimate for Telecommunications Services in
support of Special Education Satellite Project

Reference: Mr. David Green's letter of 3/6/78 requesting
such estimates

Dear Rusty:

March 17, 1978

In addition to the subject cost estimates requested by
Dave Green, RCA Americom is pleased to respond to various
questions/action items resulting from our Lexington, Ky.
meeting. These shall be addressed first, as follows:

- 1) Transmitting simultaneously from two separate locations
would require additional transponder space allocation,
thereby increasing the costs for that element by a factor
of two, thus increasing the quoted price by \$500/month.
- 2) RCA Americom has contracts with the television carriers
listed in the attached table.
- 3) RCA Americom has supported special programming for
minority groups. We are currently supporting an
experimental program being conducted by NASA to provide
duplex video between selected U.S. Indian Reservations
and Washington, D.C. for training purposes. Hopefully,
this program will be expanded to a full operational system
by the 1980 time frame.

Also, RCA has provided video services to special groups
such as the Spanish International Network and is current-
ly supporting the National Black Network in development
of their future audio and visual requirements.

Based on the foregoing, it can be stated that RCA Americom
is fully committed to the use of satellites in support of
specialized training requirements and shall endeavor to
provide the necessary technical and cost data inputs to
help achieve success of such applications.

March 17, 1978

In accordance with your request for budgetary prices for fifty hours of simplex video from San Francisco/Washington, D.C. to ten CATV companies located in Virginia, Minnesota and California, the following detail is provided. Prices quoted assume provision for tail circuit connection to the RCA CTO's in San Francisco or Washington, D.C. from the point of program origin. We understand that these tails are being provided under separate arrangement.

Current Pricing (for Uplink & 10 Downlinks)

One full transponder, unprotected for occasional use in off-peak hours-----\$1,800.00/Hour

Projected Pricing* (for Uplink & 10 Downlinks)

Half transponder service, unprotected for occasional use in off-peak hours-----\$1,600.00/Hour

* This price is more realistic considering the 1979 time frame when half-transponder service is expected to be routinely available.

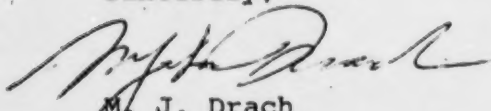
Relative to the request for pricing of a dedicated narrowband circuit (5-15 KHz) we have estimated the costs for the San Francisco to Reston, VA. circuit. This budgetary price for full period service including tail circuits, is provided below:

One-time non-recurring charge (NRC)-----\$6,500.00
Monthly recurring charge (MRC)-----\$8,300.00

As I mentioned in the last meeting, it may be less expensive to utilize telco loops since RCA currently has no earth station facilities within a reasonable distance of Lexington, Ky., thus pricing for a link to this location would be prohibitive.

If any questions arise, please feel free to contact me or Gene Boyle. I wish you the best in your efforts to reach the next plateau with NIE. Thank you for the cordial reception given me in Lexington.

Sincerely,



M. J. Drach
Manager
Federal Systems

cc: J. Boning
E. W. Boyle
D. Green

LIST OF CURRENT TELEVISION
CARRIERS UNDER CONTRACT TO RCA AMERICOM

Home Box Office, New York, N.Y.

Southern Satellite Systems, Inc., Tulsa, Ok.

Christian Broadcast Network, Virginia Beach, Va.

Viacom/Showtime Entertainment, Inc., New York, N.Y.

PTL Television Network, Charlotte, N.C.

Fanfare Television, Inc., Houston, Tx.

Satellite Communications Systems, Inc., Tulsa, Ok.

UA-Columbia Cablevision, Inc., New York, N.Y.